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(12) **United States Patent**
Coroneos

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(54) **AEROSOL CONTAINER RESUSCITATOR**

(76) Inventor: **Donald L. Coroneos**, Waukegan, IL (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **13/539,665**

(22) Filed: **Jul. 2, 2012**

(51) **Int. Cl.**
B65D 83/00 (2006.01)

(52) **U.S. Cl.**
USPC **222/402.1**; 222/402.13

(58) **Field of Classification Search**
USPC 222/402.1, 402.13, 182, 402.15, 222/635, 394
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2,530,583	A		11/1950	Nurkiewicz	
3,187,962	A		6/1965	Meshberg	
3,289,949	A	*	12/1966	Roth	239/579
3,428,224	A		2/1969	Eberhardt et al.	
3,613,960	A	*	10/1971	Beard	222/330
3,635,379	A		1/1972	Angele	
3,638,840	A		2/1972	Ishida	
3,733,031	A	*	5/1973	Marand	239/349
3,776,226	A	*	12/1973	Triplett	128/200.23
3,776,427	A	*	12/1973	Remane	222/394
3,900,139	A		8/1975	Myers	
4,062,517	A	*	12/1977	Jones	251/322
4,211,347	A		7/1980	Milderm	
4,228,933	A		10/1980	Elson	
4,469,252	A		9/1984	Obrist	
4,911,336	A		3/1990	Blake	
4,971,224	A		11/1990	Scremin	
5,070,858	A		12/1991	Wang	
5,154,323	A		10/1992	Query et al.	
5,183,189	A		2/1993	Baudin	
5,383,580	A		1/1995	Winder	
5,489,047	A		2/1996	Winder	
5,657,908	A		8/1997	Graver	
5,957,333	A		9/1999	Losenno et al.	
6,138,714	A		10/2000	Kim	
6,474,513	B2		11/2002	Burt	
6,481,470	B1		11/2002	Rubenic	
6,926,172	B2		8/2005	Jaworski et al.	
2002/0030068	A1		3/2002	Burt	
2005/0121476	A1		6/2005	Pauls et al.	
2006/0011665	A1		1/2006	Garner	
2008/0230559	A1		9/2008	Nardone	
2011/0017780	A1	*	1/2011	Coroneos	222/402.1

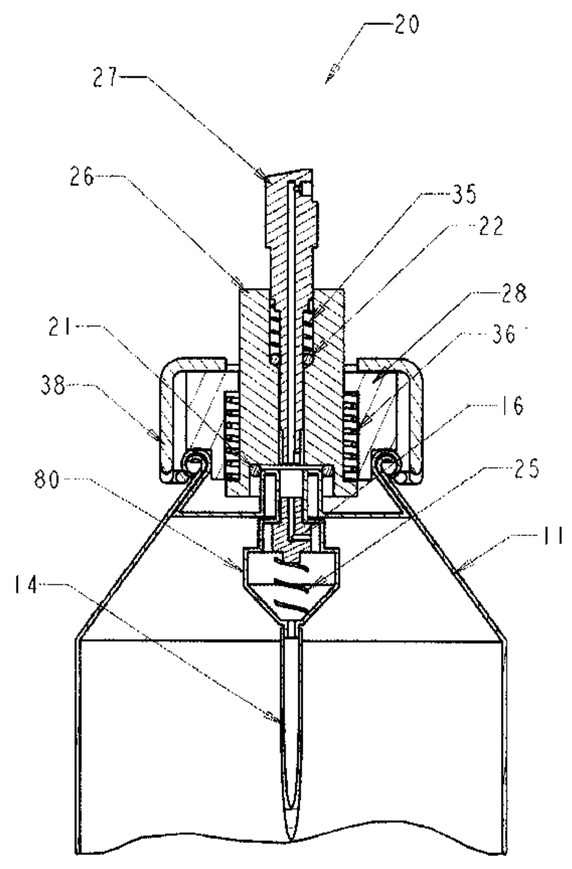
* cited by examiner

Primary Examiner — Paul R Durand
Assistant Examiner — Vishal Pancholi
(74) *Attorney, Agent, or Firm* — Meroni & Meroni, P.C.; Charles F. Meroni, Jr.; Christopher J. Scott

(57) **ABSTRACT**

A aerosol container resuscitator restores functionality to a damaged or otherwise compromised aerosol container by being attachable to the annular container rim adjacent the container outlet, and by opening the valve of the compromised outlet and subsequently directing the aerosol container's product as purposed. The aerosol container resuscitator comprises an annular fitting assembly and a driver assembly. The fitting assembly comprises a fitting structure and a clamping structure. The fitting assembly aligns, secures, and interfaces the driver assembly to the container, which driver assembly comprises gasket structures, spring structures, a sleeve structure and a driver structure. The sleeve structure comprises communicating cavities in which the driver structure is received. The gaskets seal and prevent discharged aerosol container's product from circumventing the driver structure of the driver assembly. The springs allow relative translation between the fitting assembly and the driver assembly and between the sleeve structure and the driver structure.

24 Claims, 21 Drawing Sheets



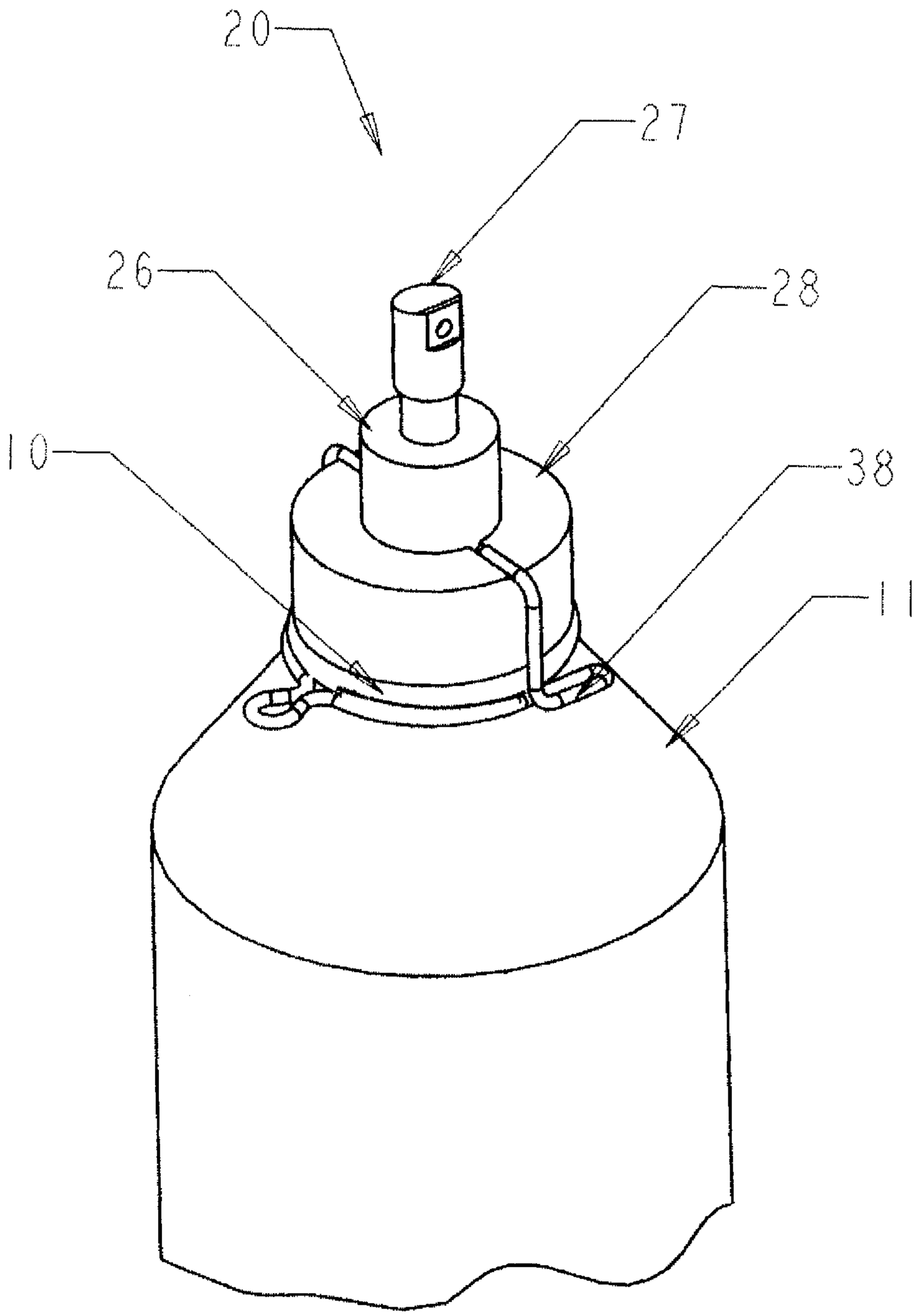


FIG. 1

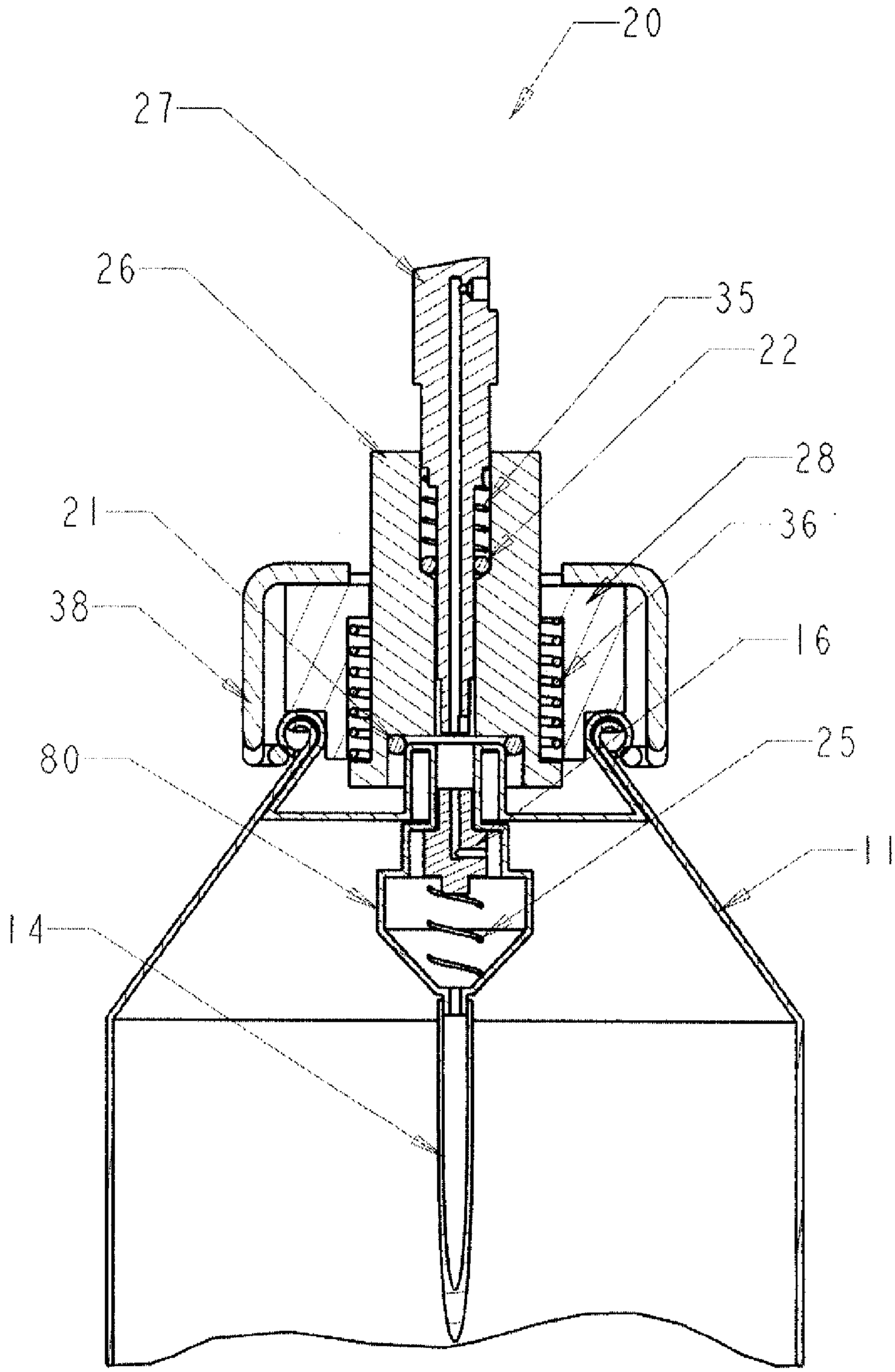


FIG. 2

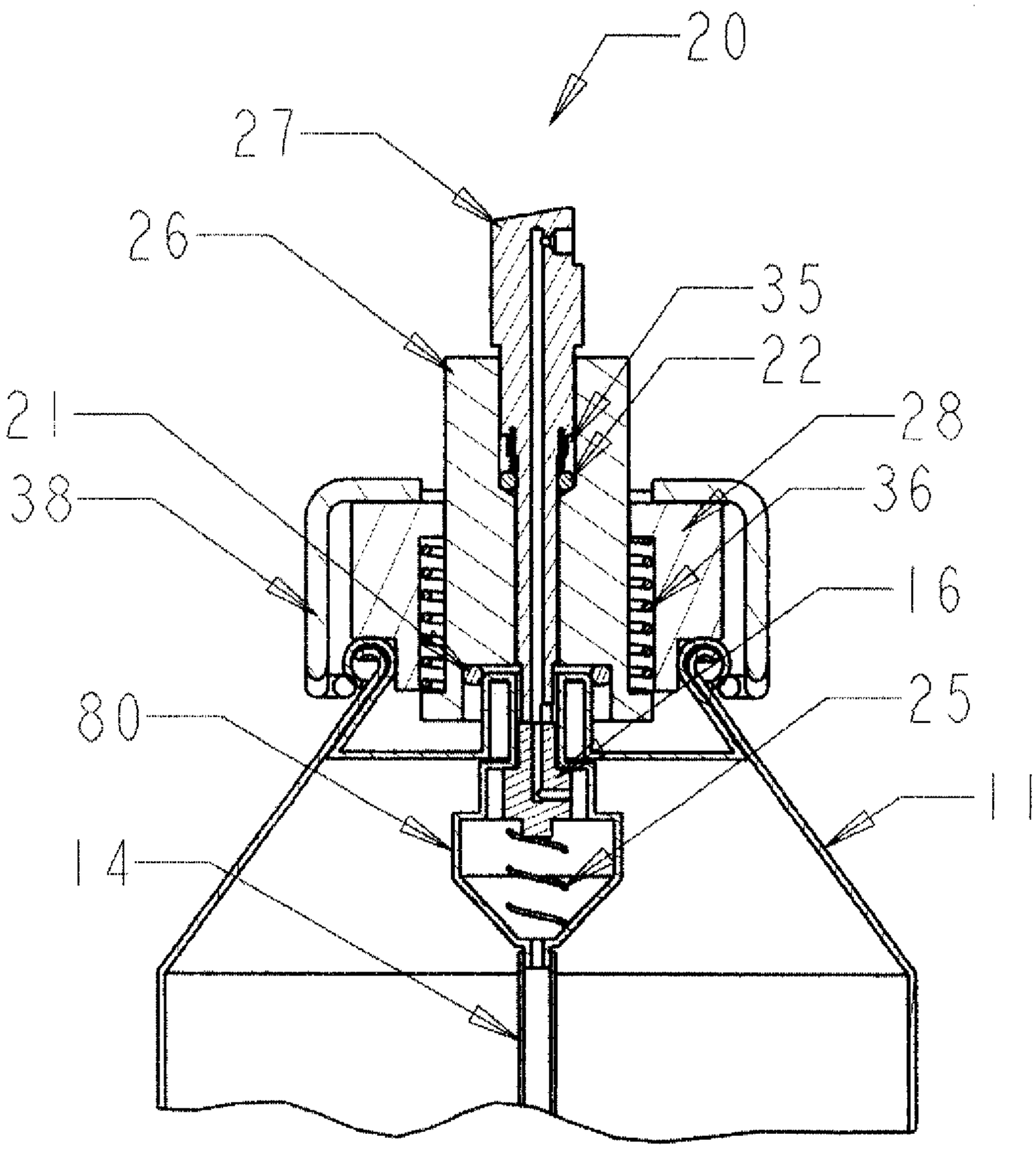


FIG. 3

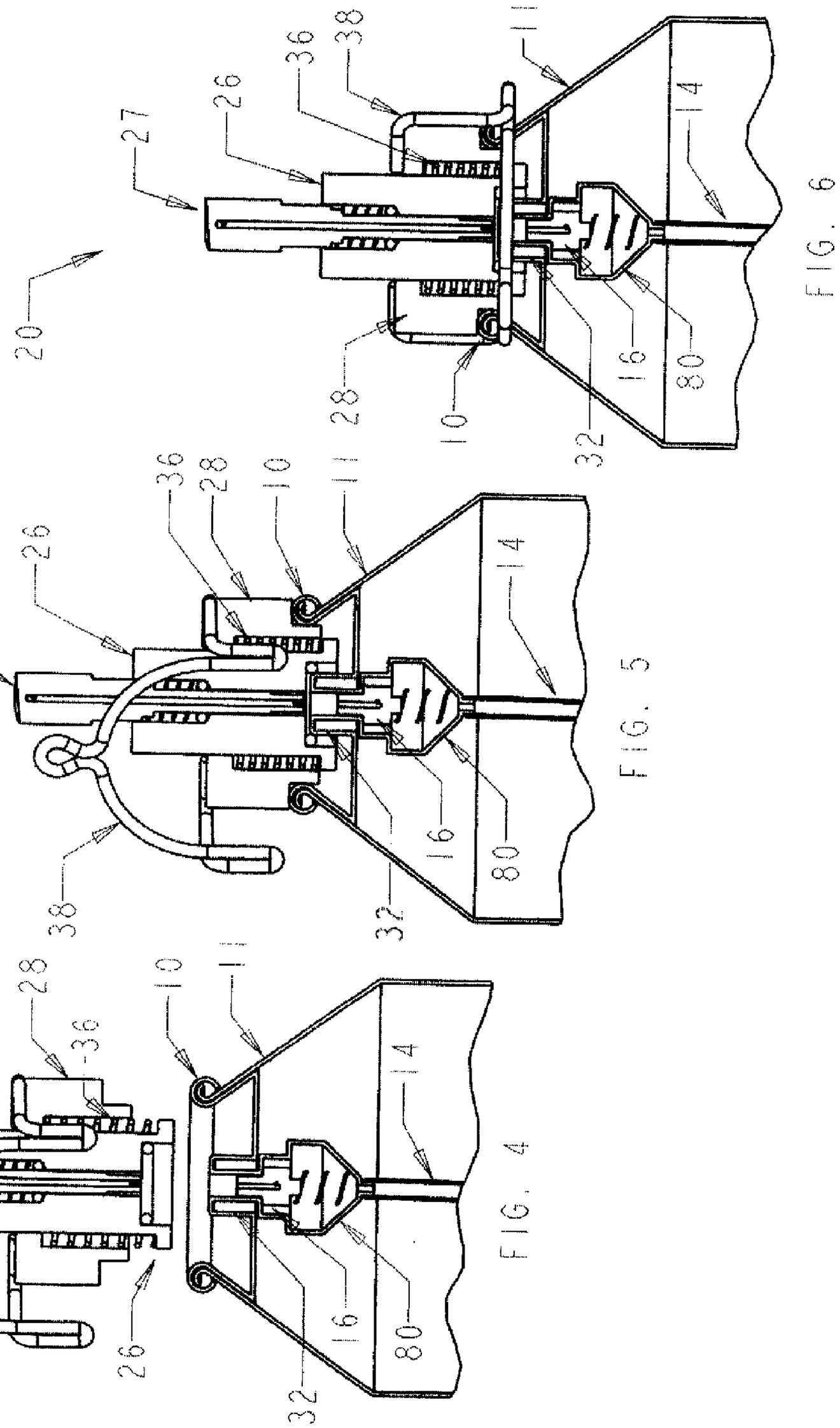


FIG. 6

FIG. 5

FIG. 4

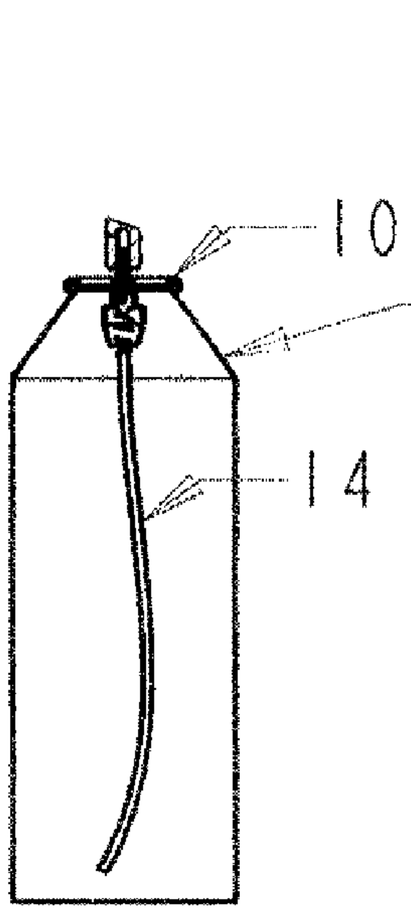


FIG. 7(a)

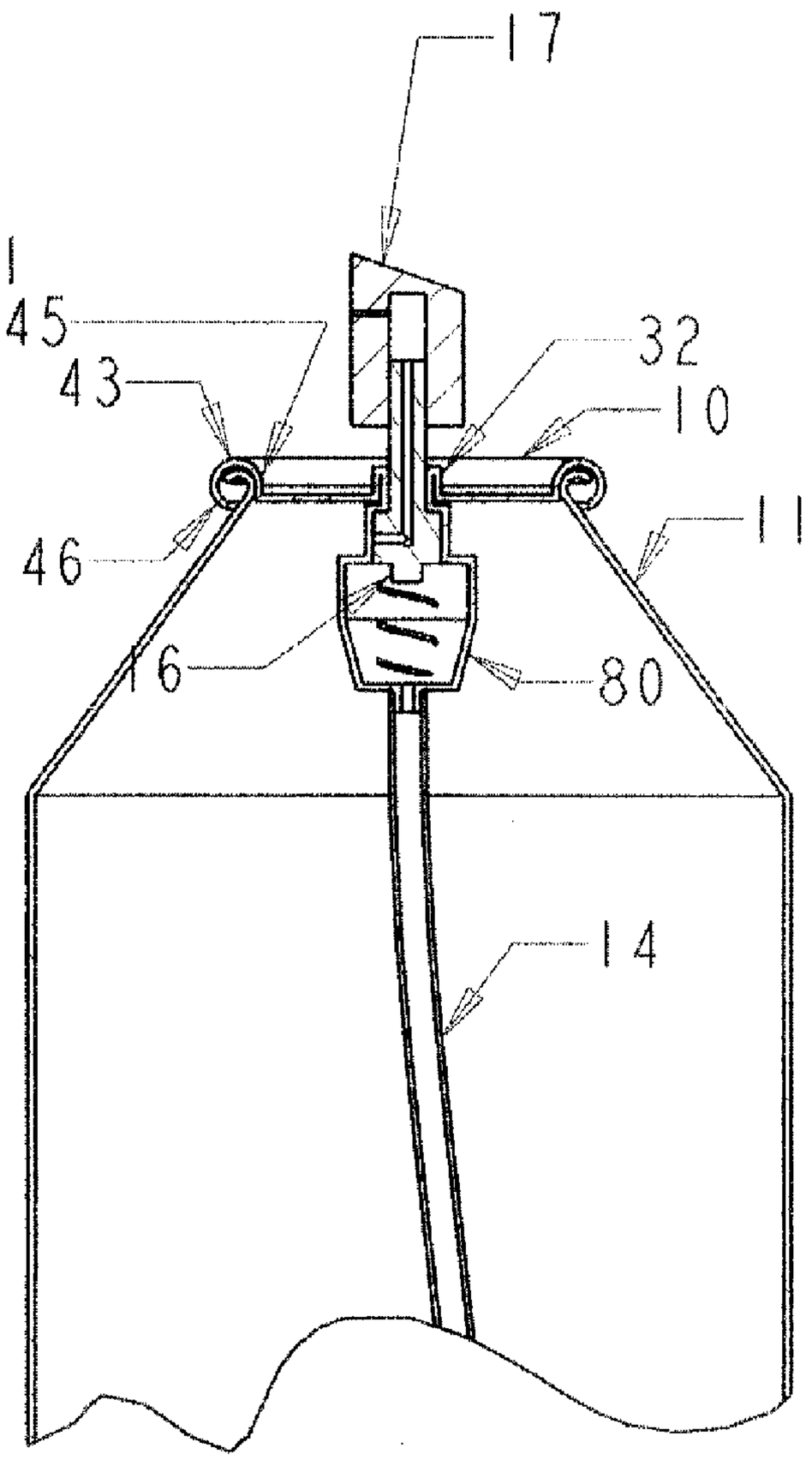


FIG. 7

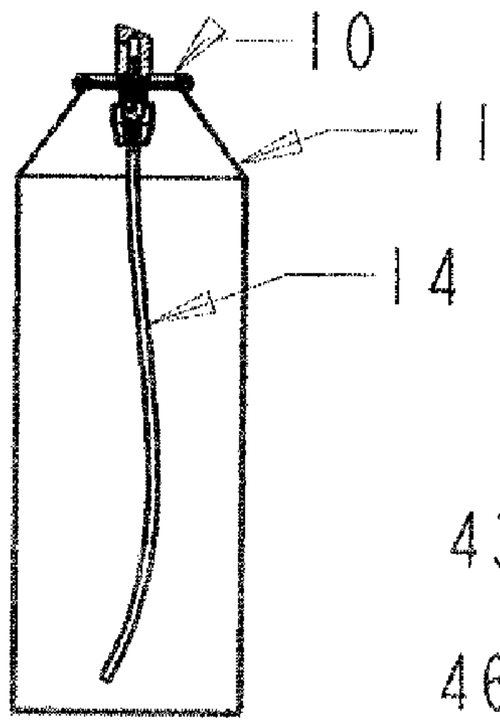


FIG. 8(a)

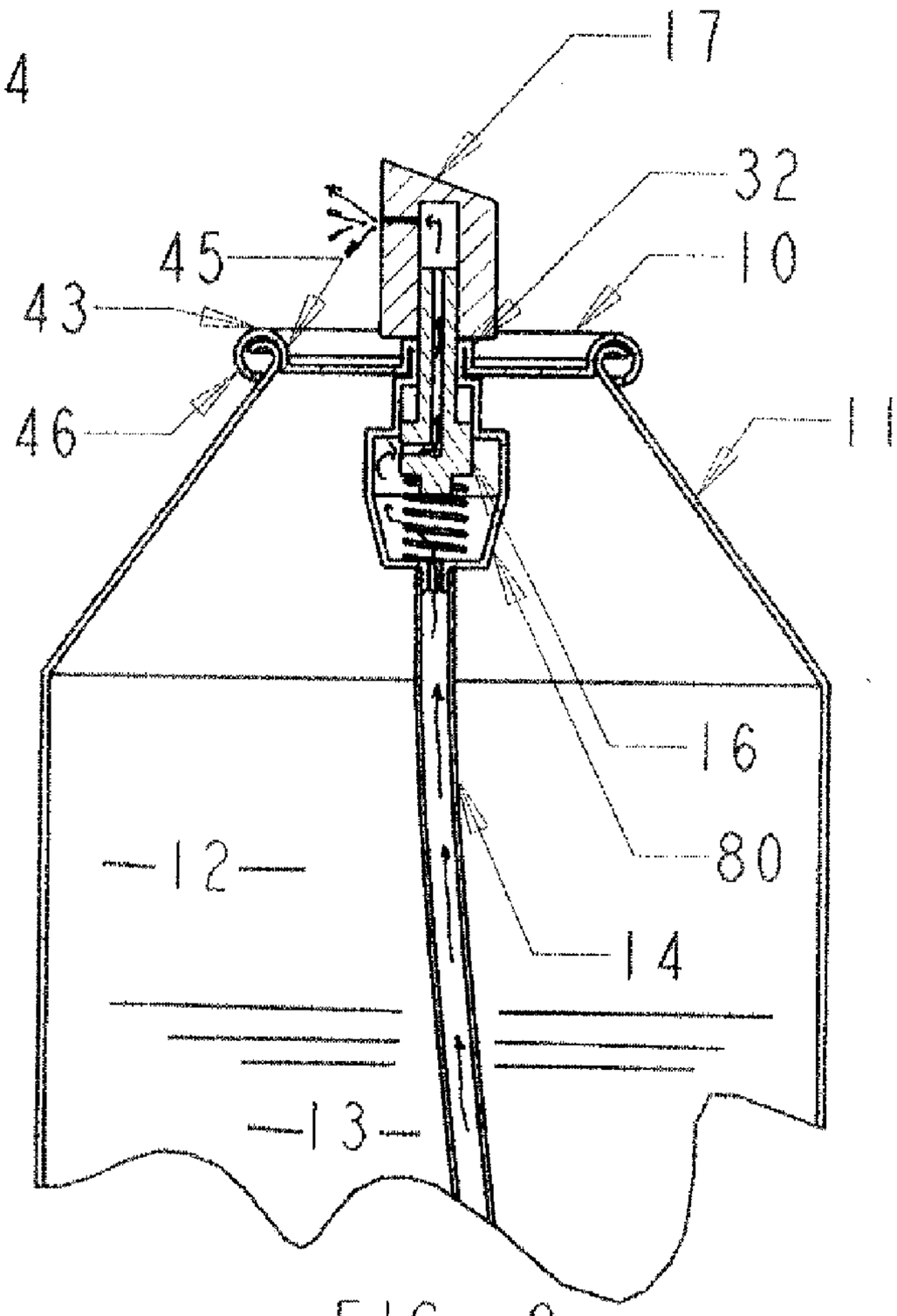


FIG. 8

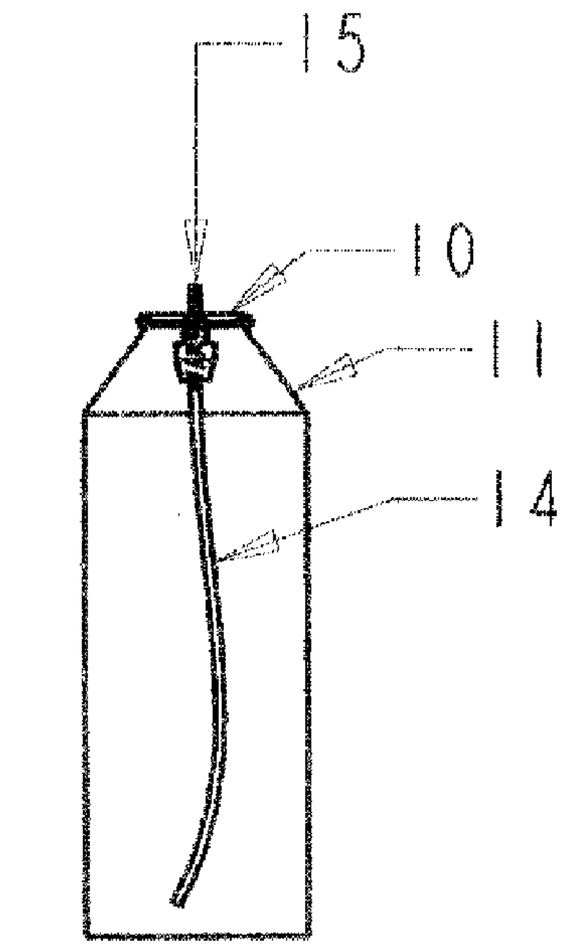


FIG. 9(a)

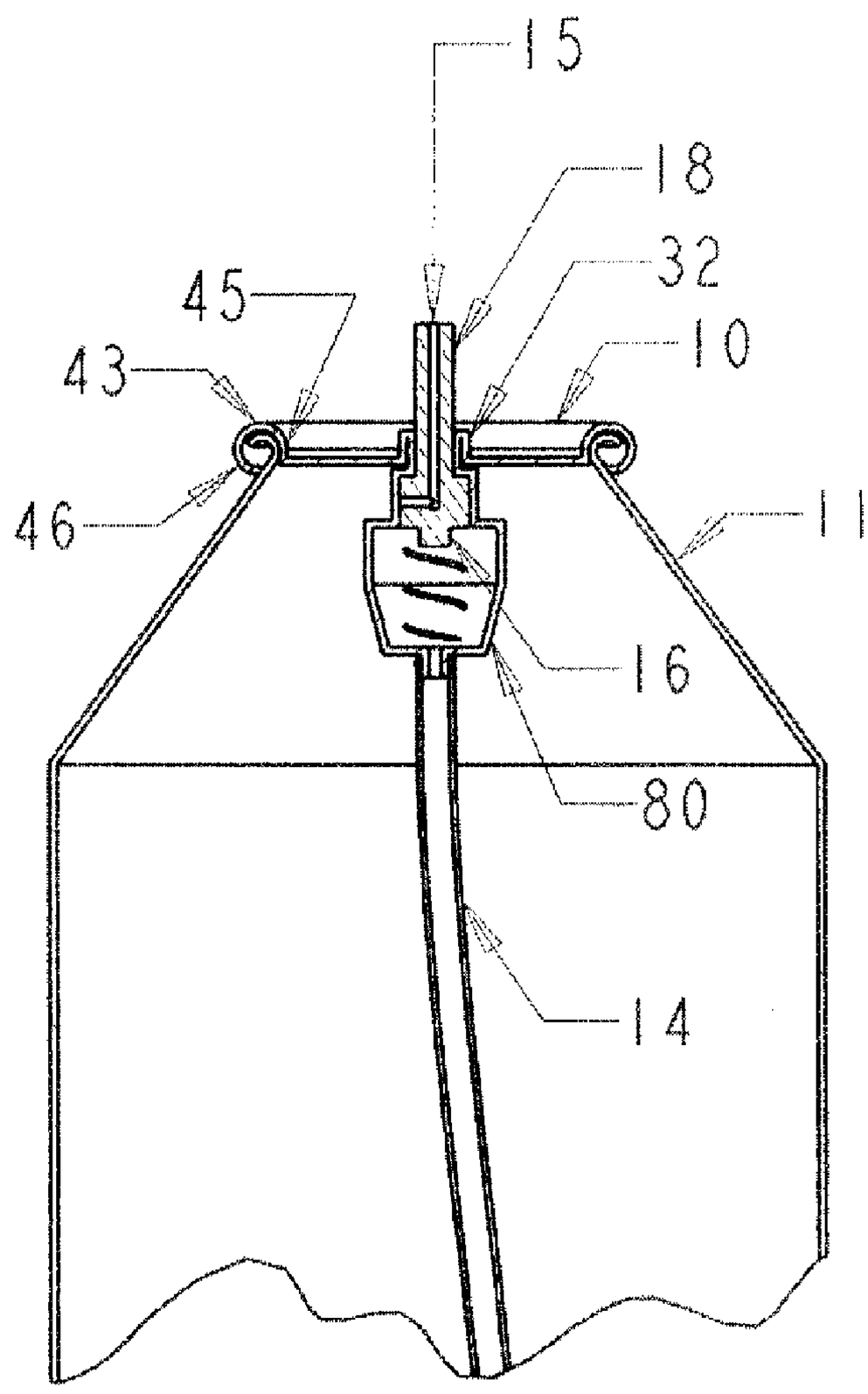


FIG. 9

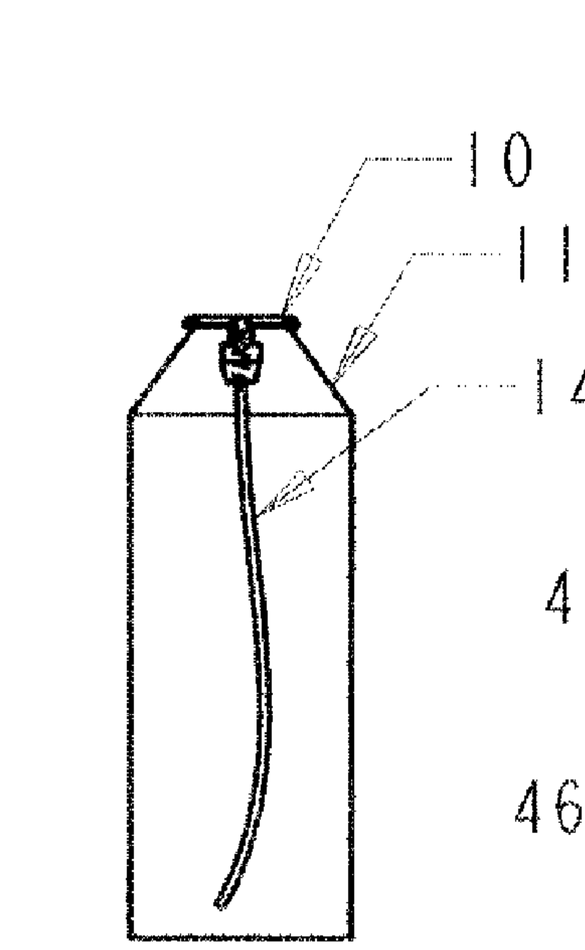


FIG. 10(a)

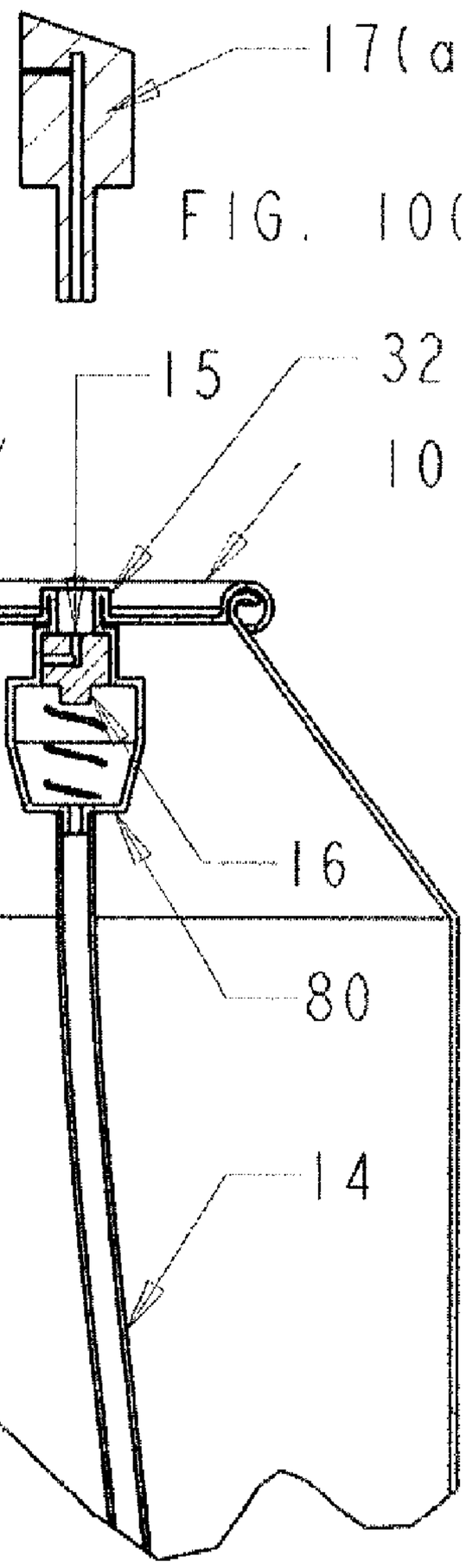
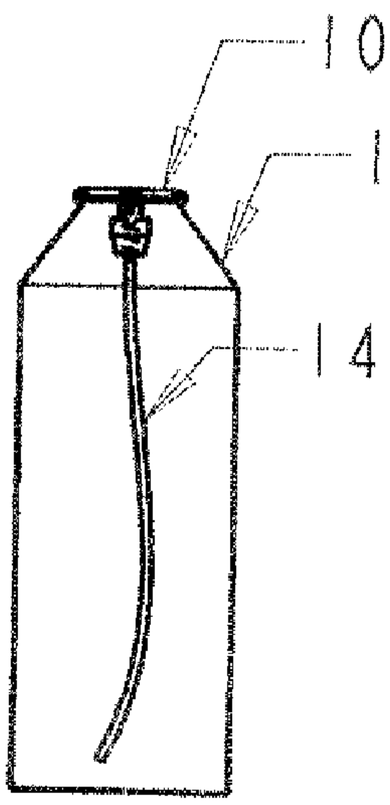


FIG. 10(b)

FIG. 10



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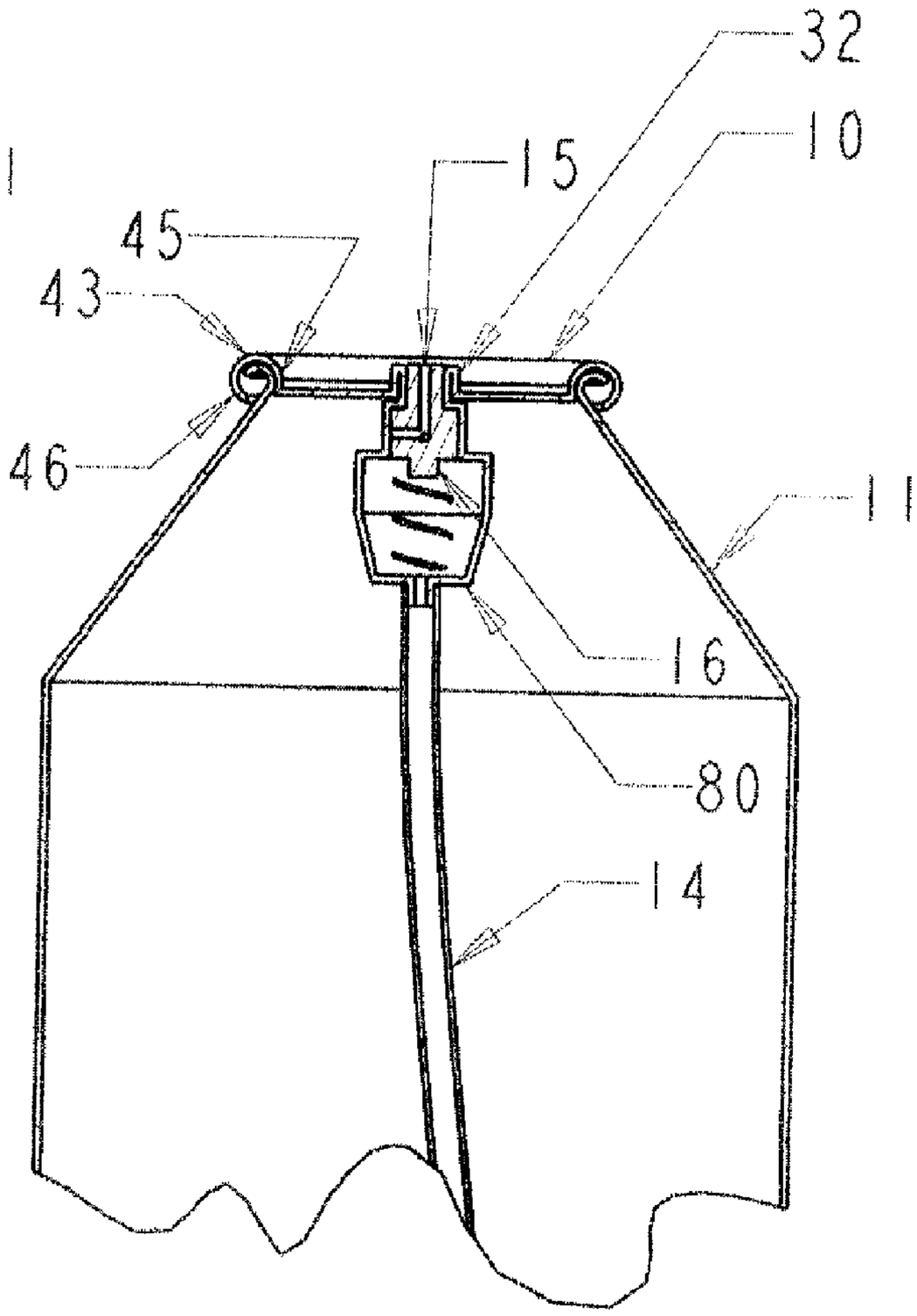


FIG. 11

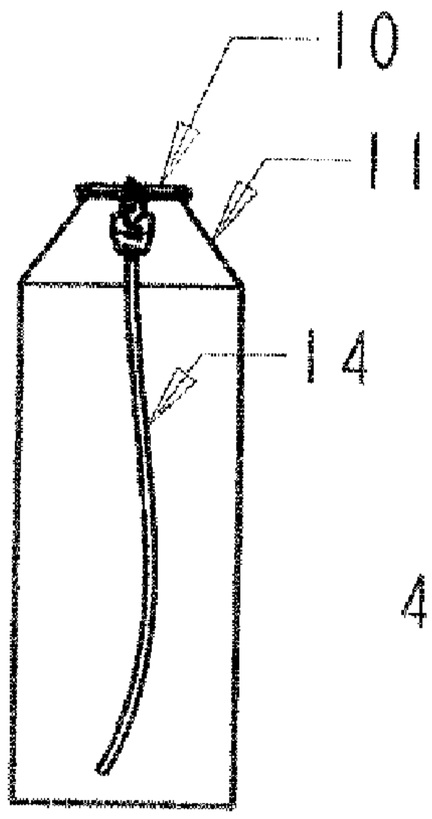


FIG. 12(a)

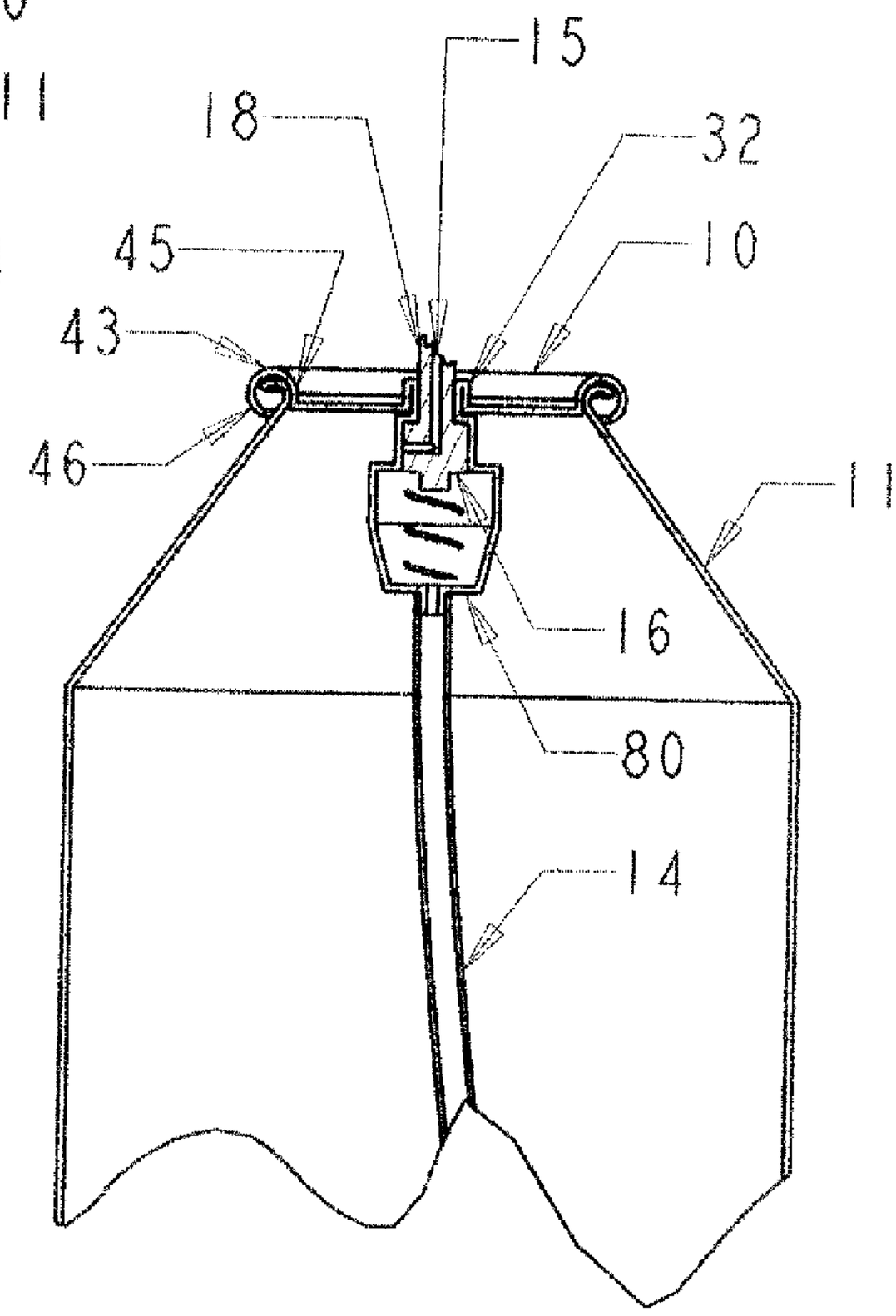


FIG. 12

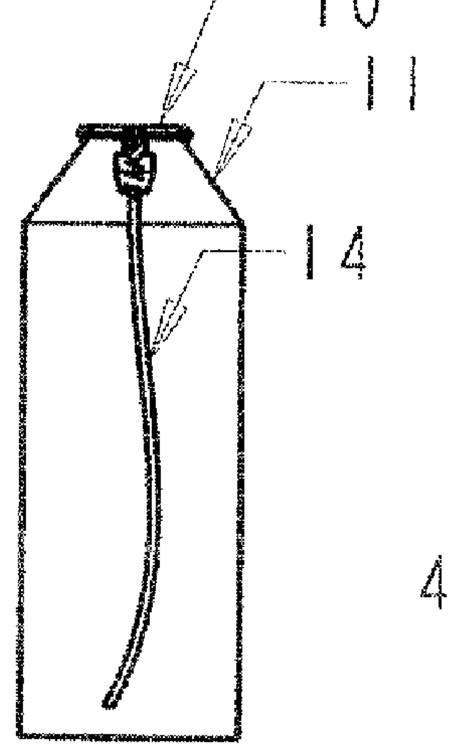


FIG. 13(a)

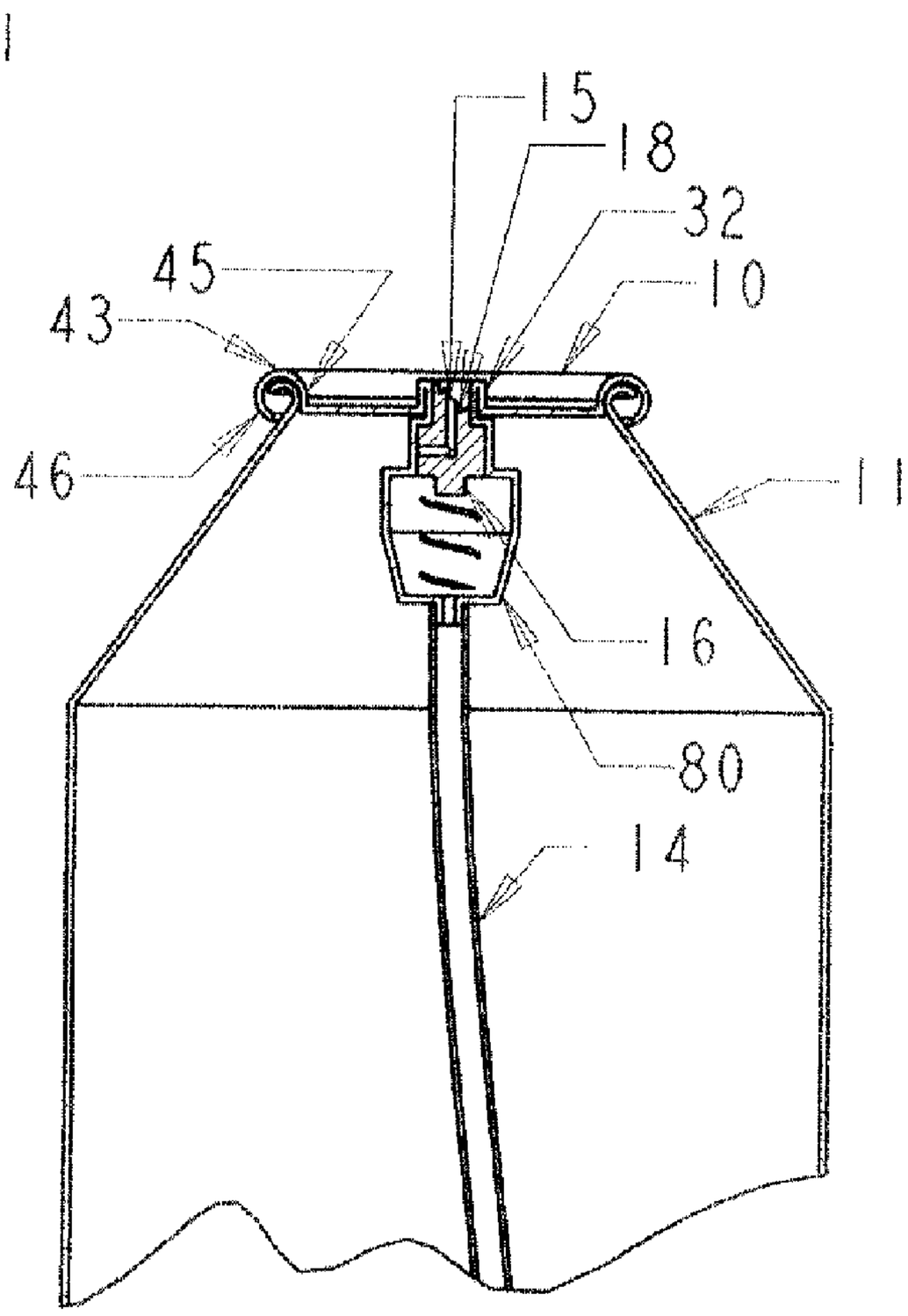
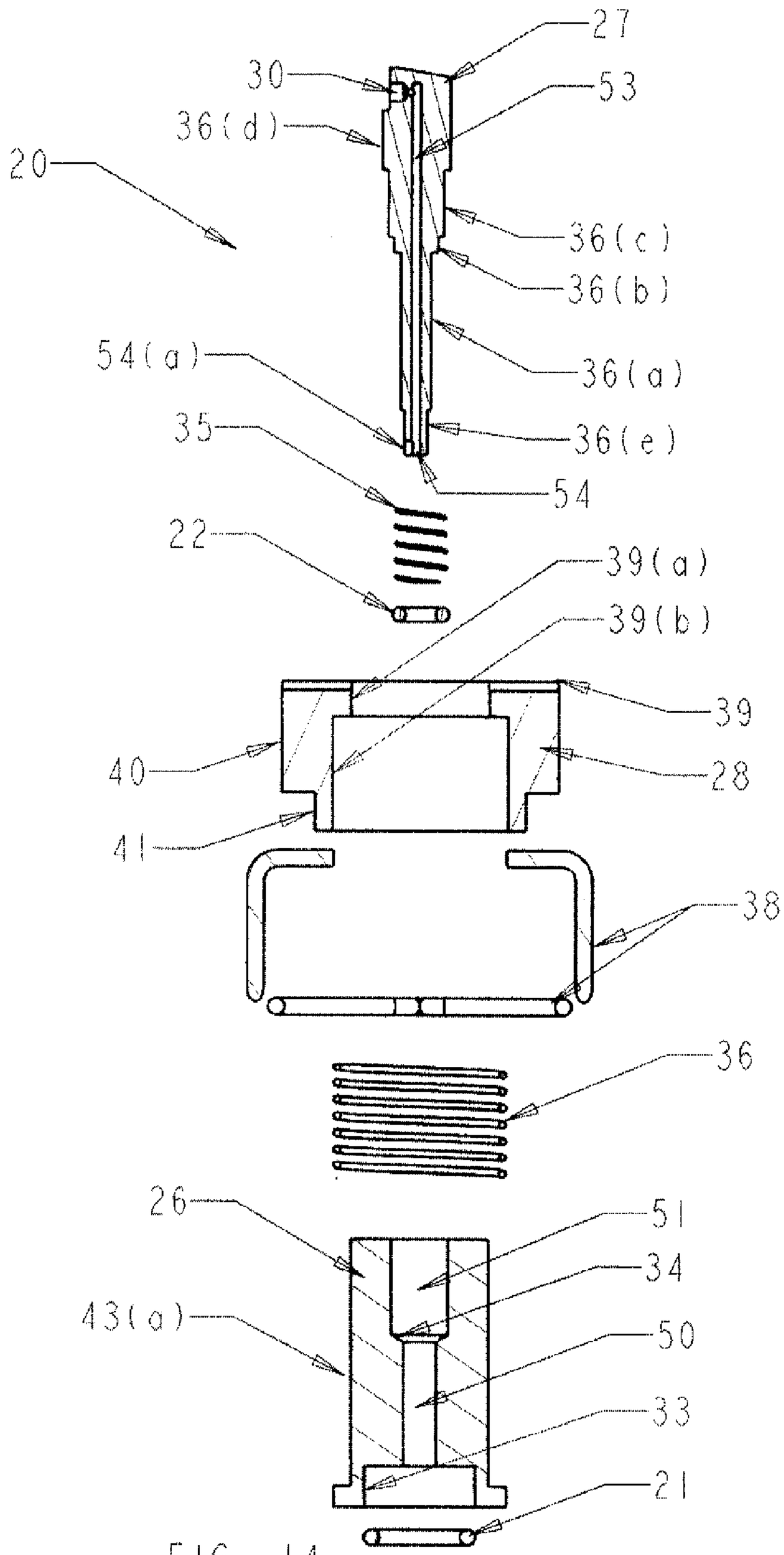


FIG. 13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36(d)
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FIG. 14

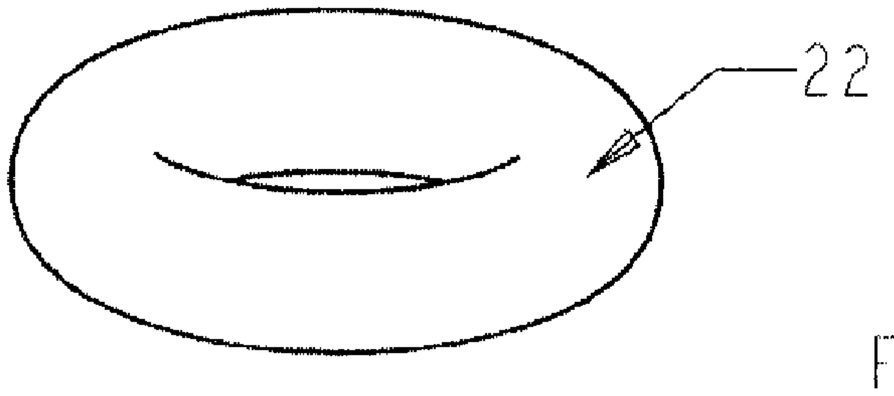

FIG. 15

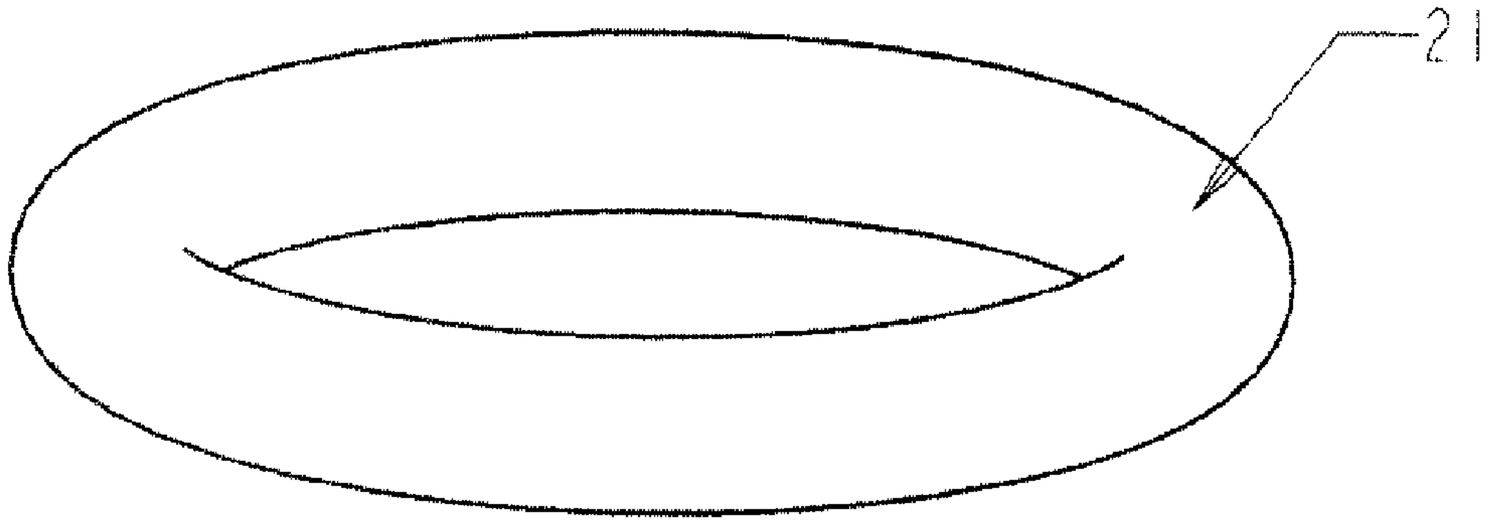

FIG. 16

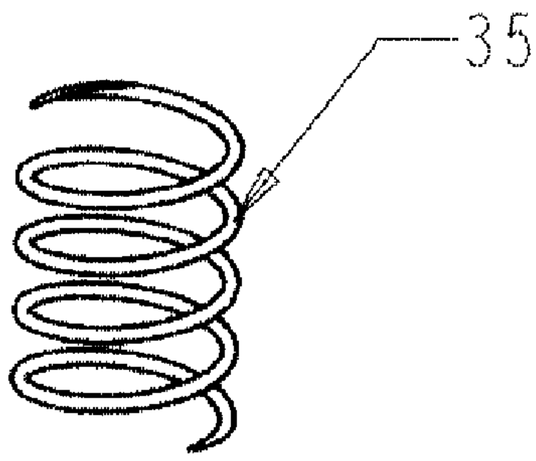

FIG. 17

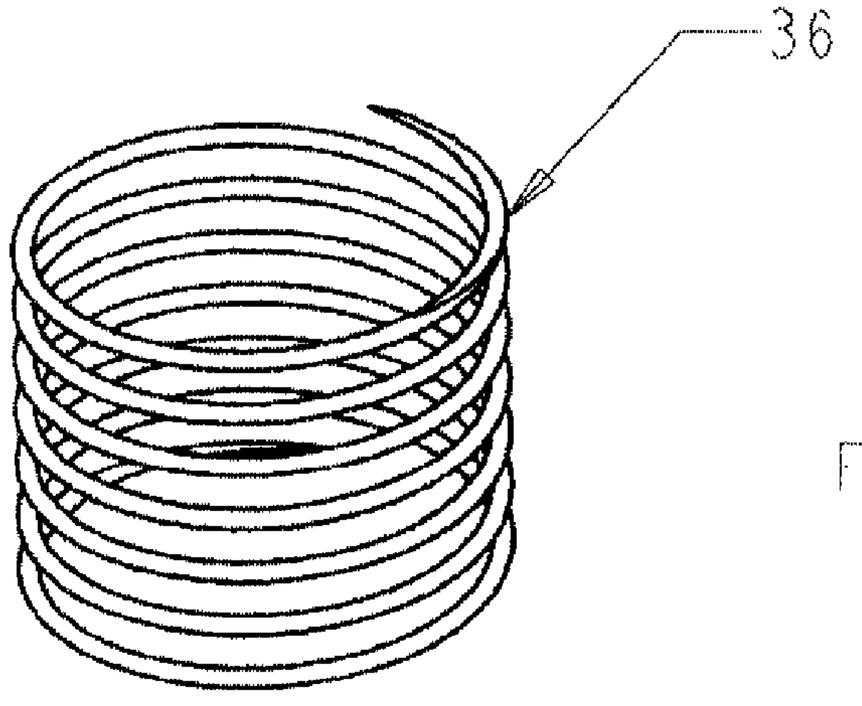

FIG. 18

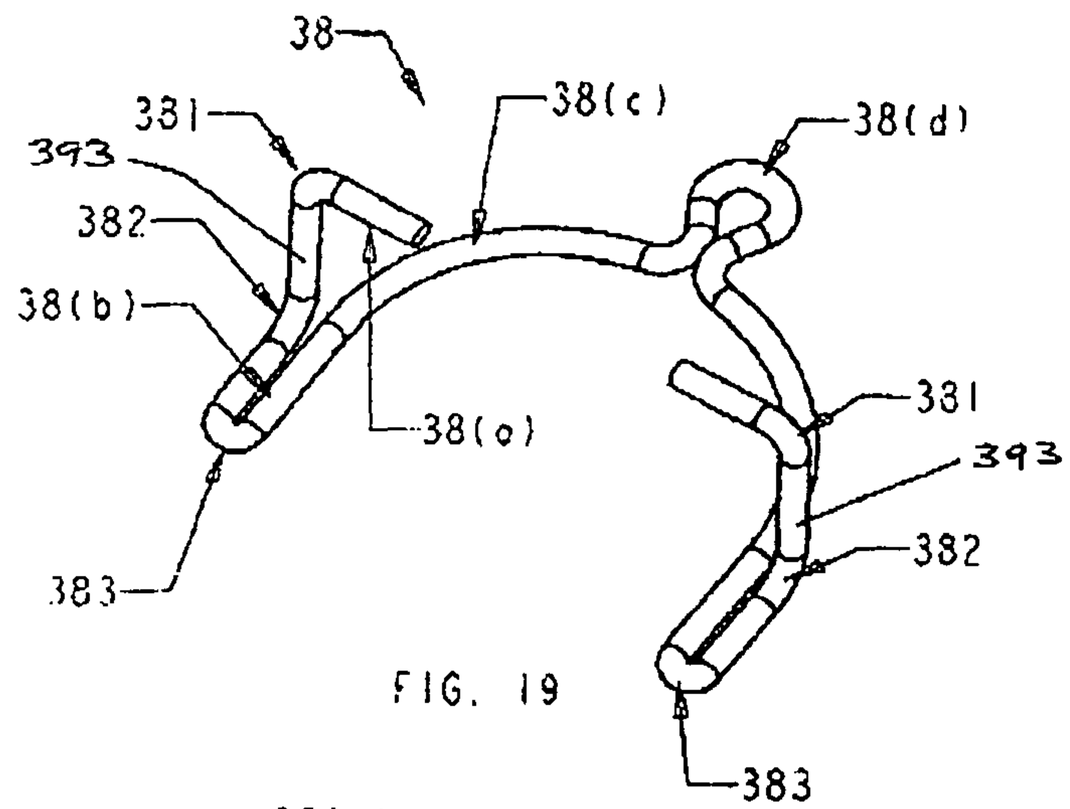

FIG. 19

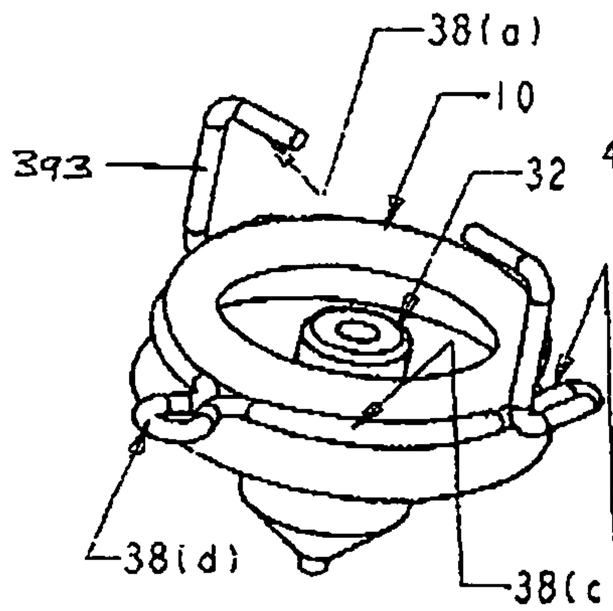

FIG. 20

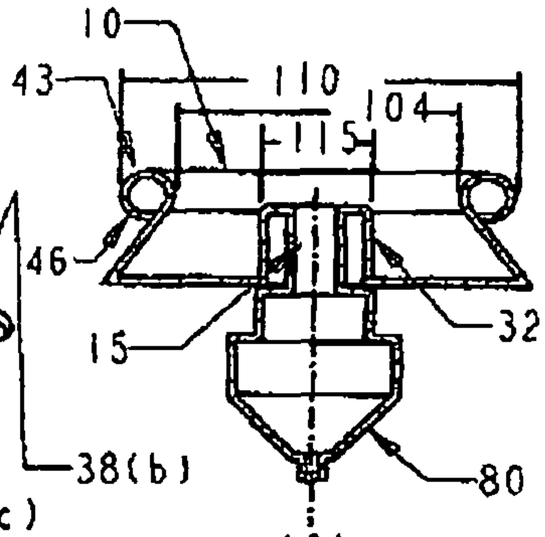

FIG. 21

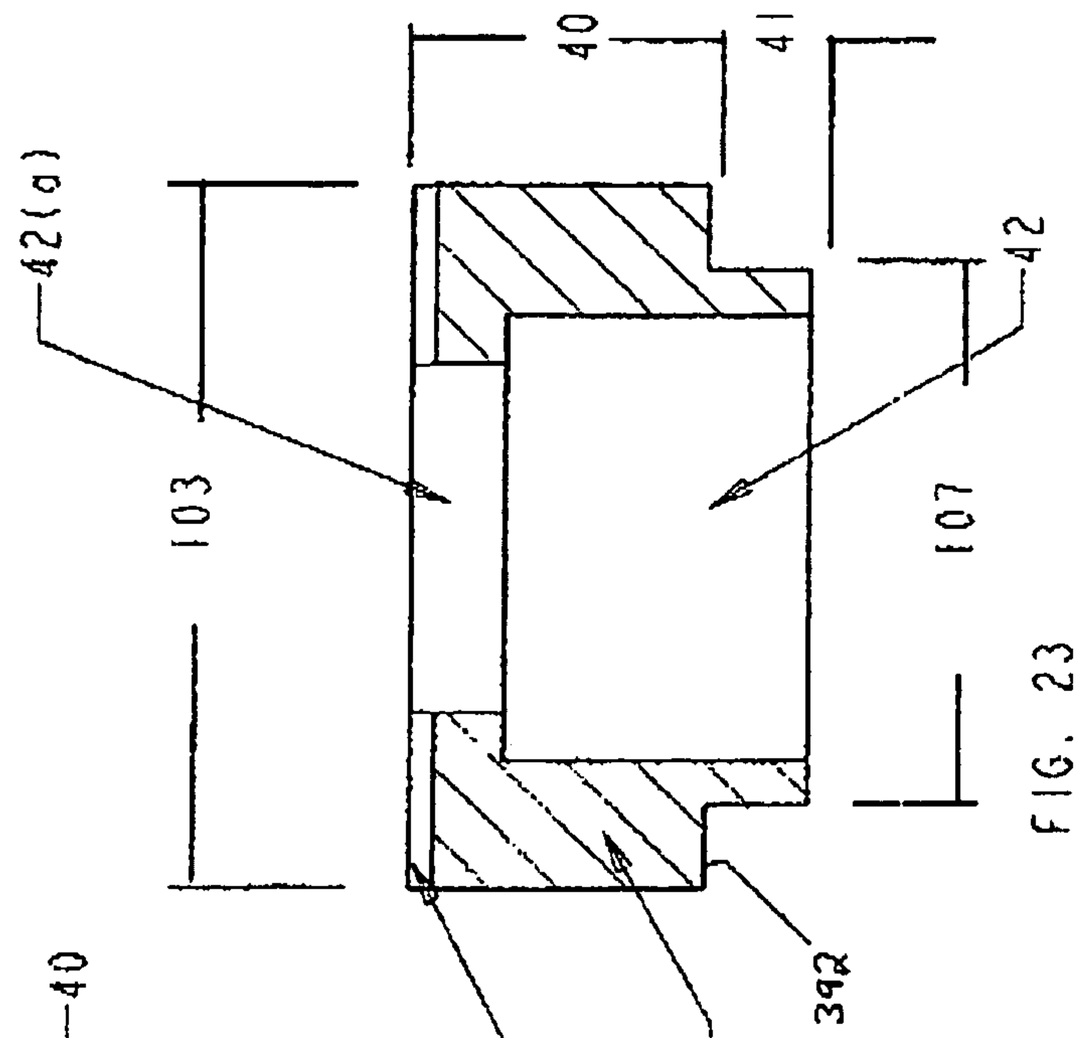

FIG. 23

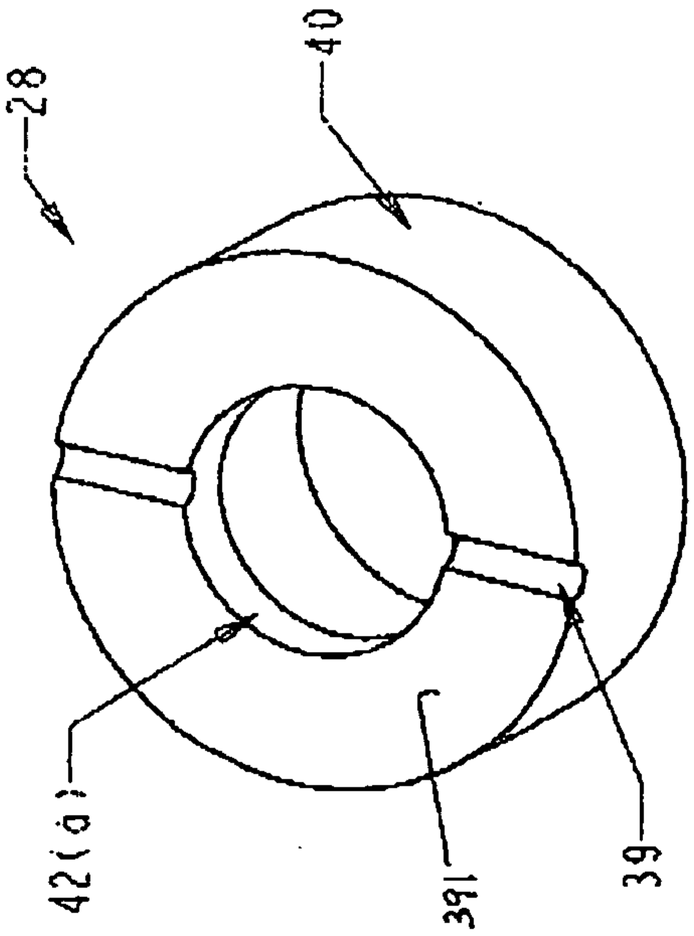

FIG. 22

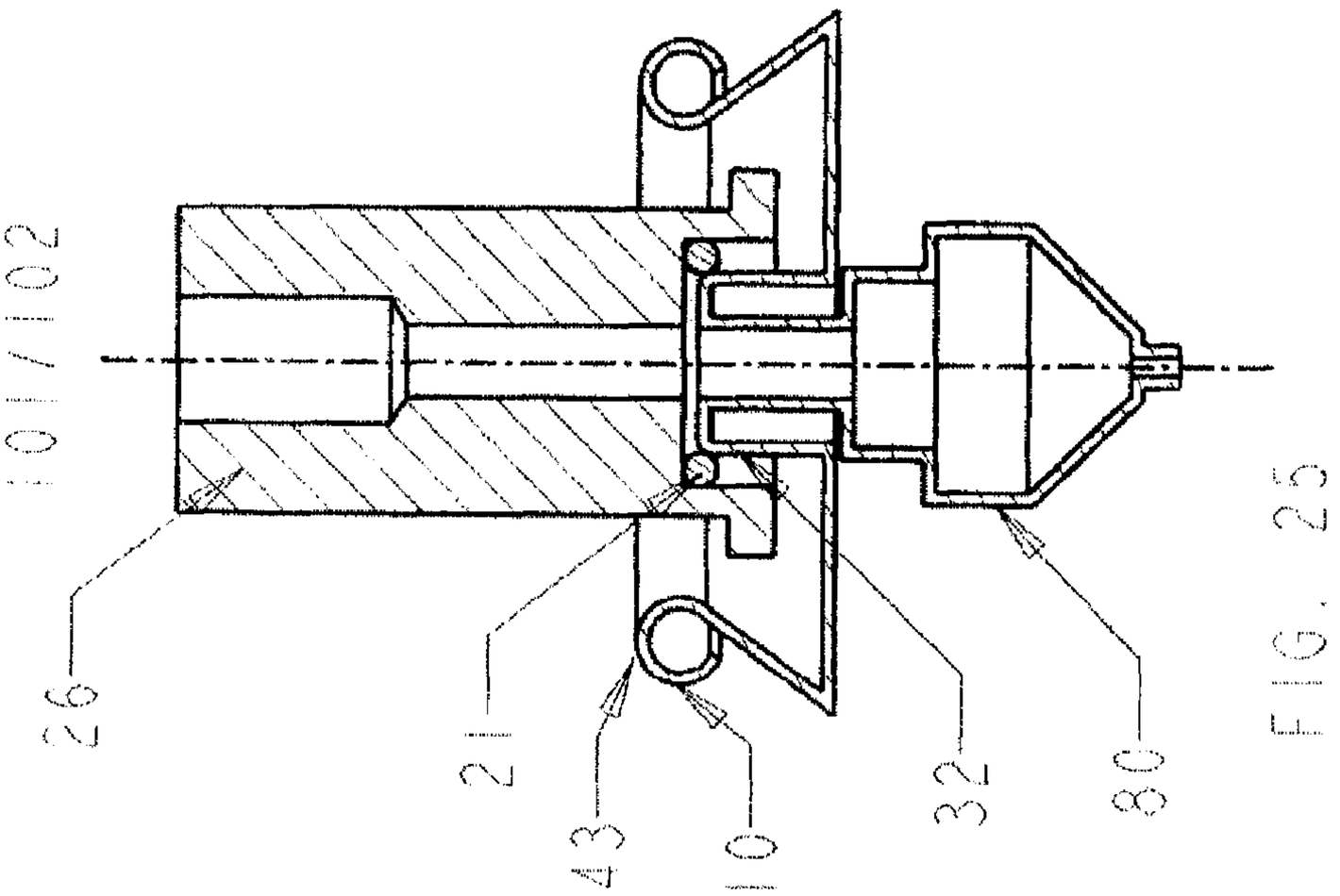

FIG. 23

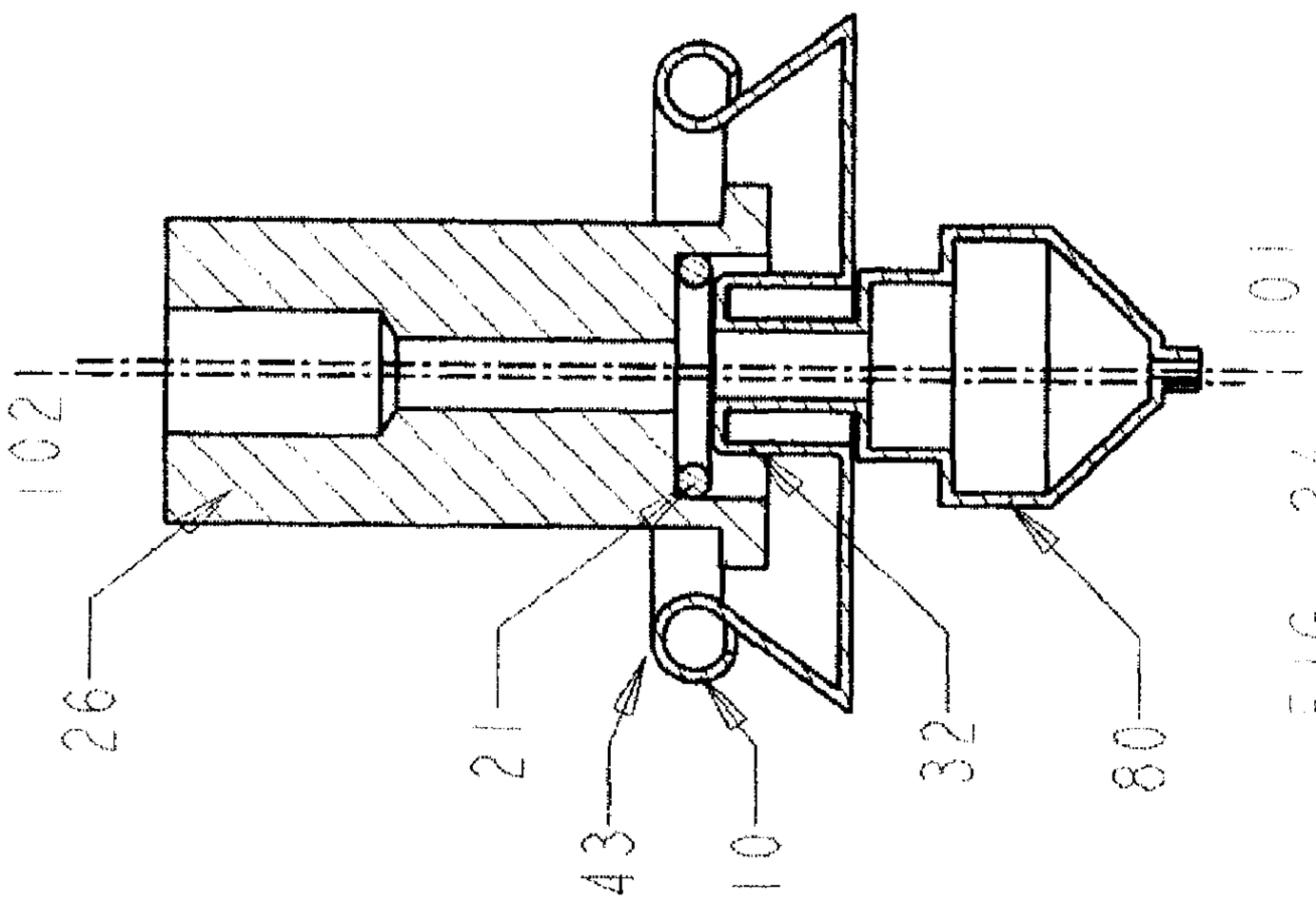

FIG. 24

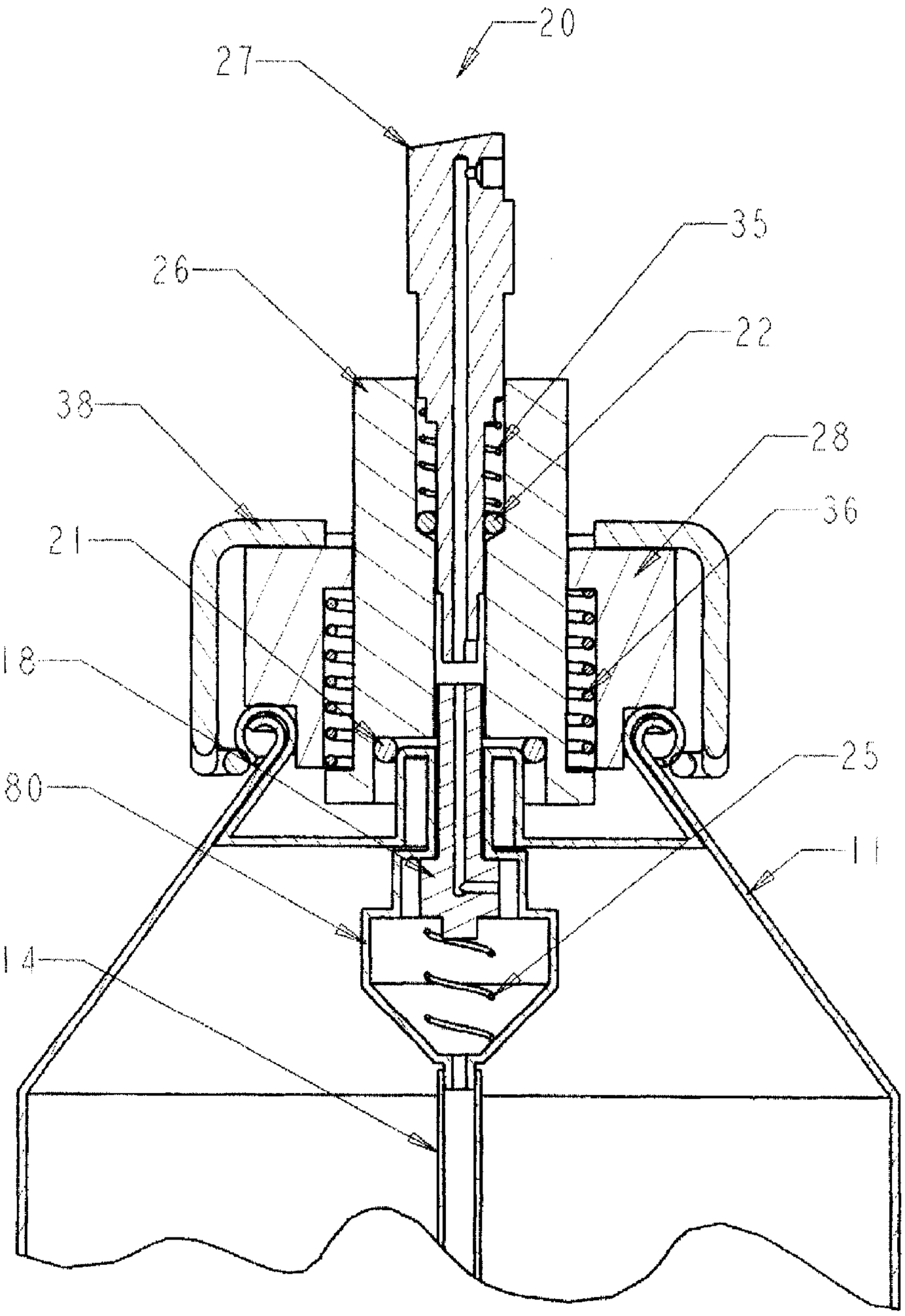

FIG. 26

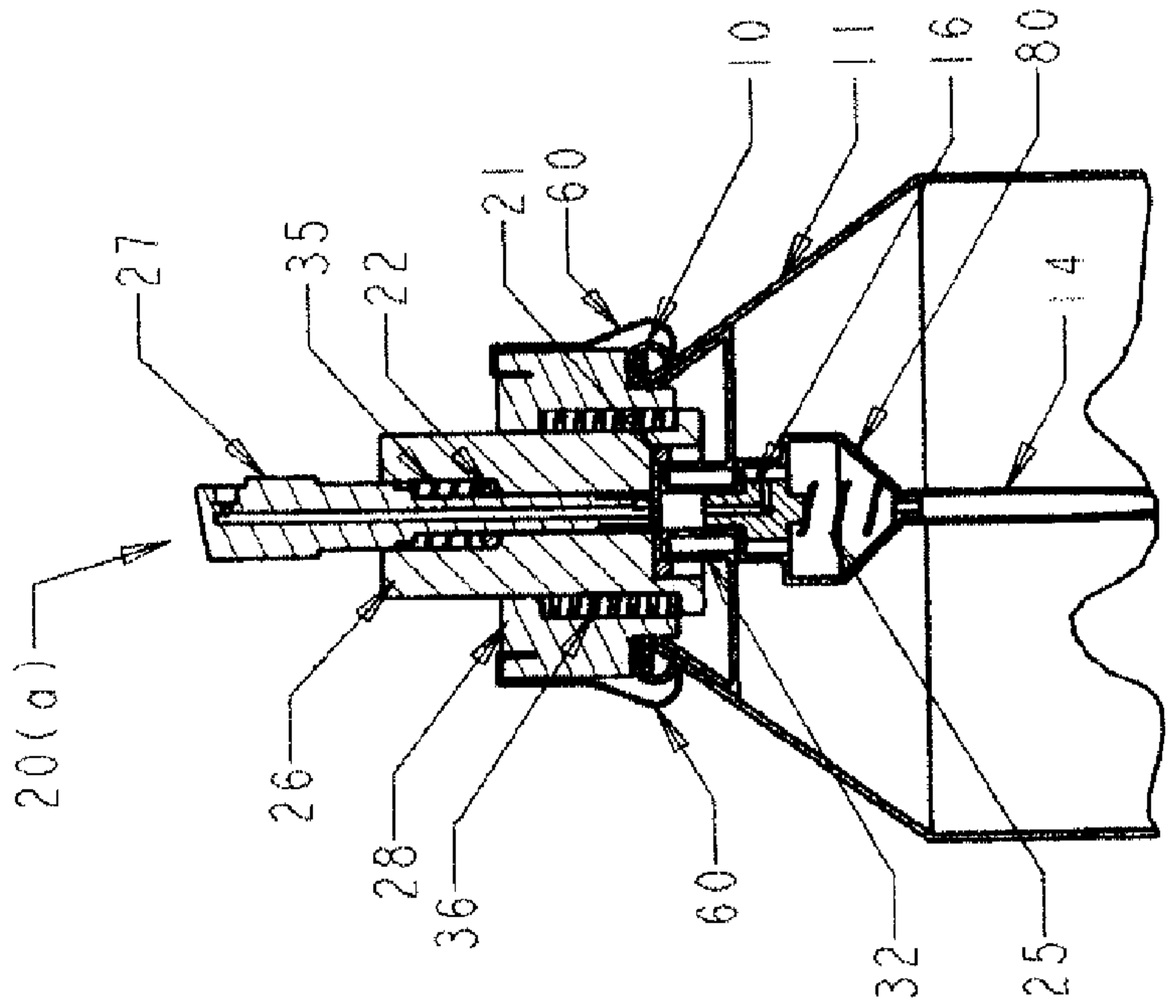

FIG. 27

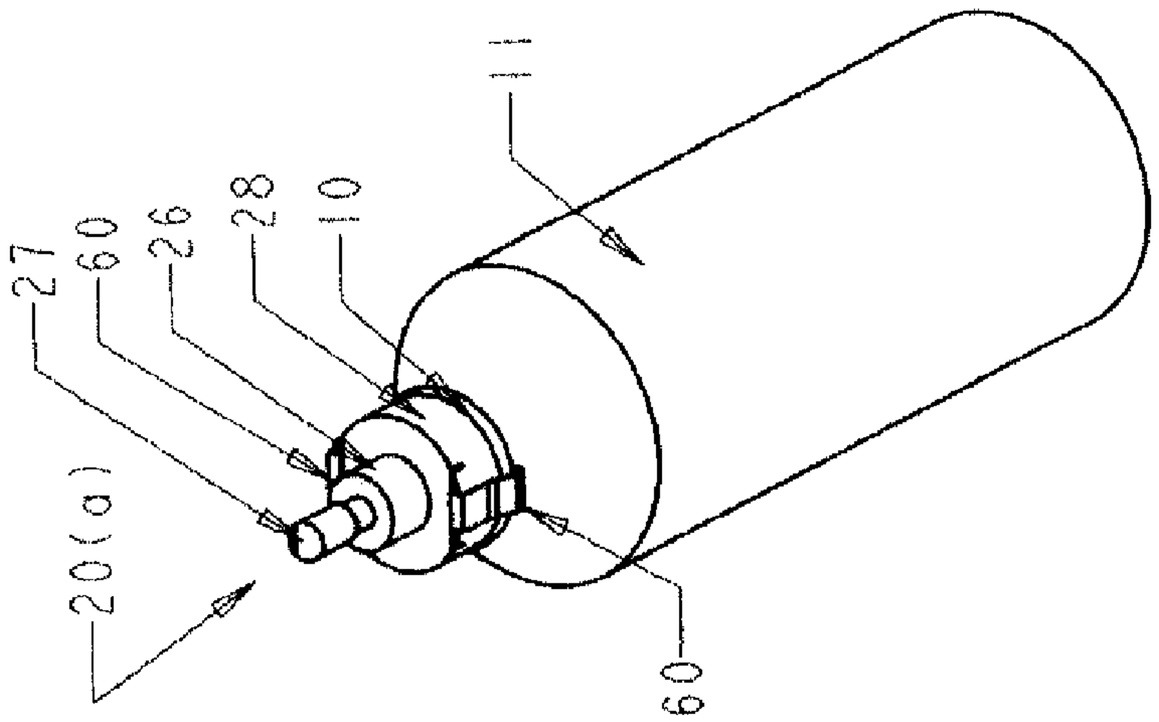

FIG. 27(a)

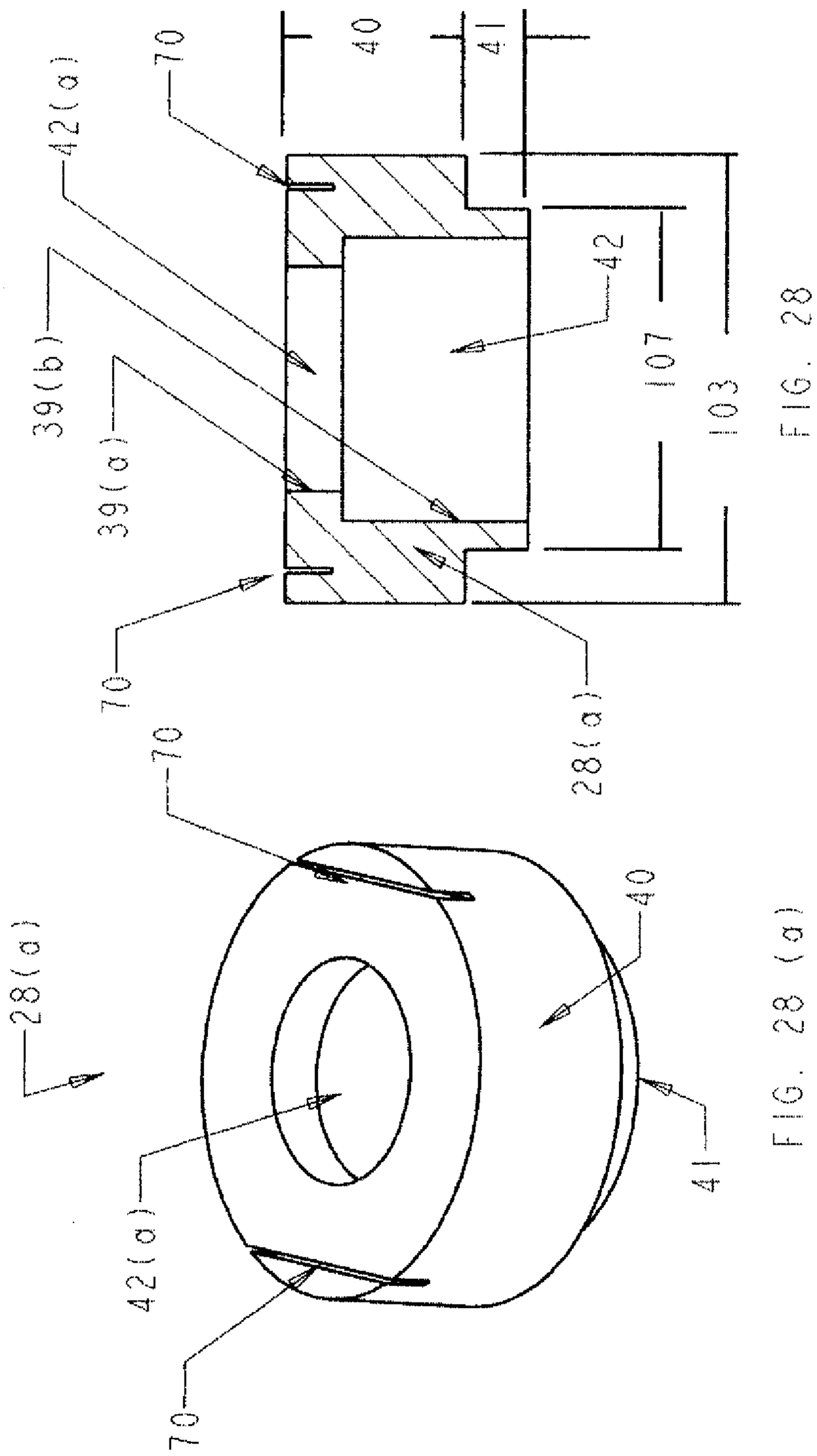

FIG. 28 (a)

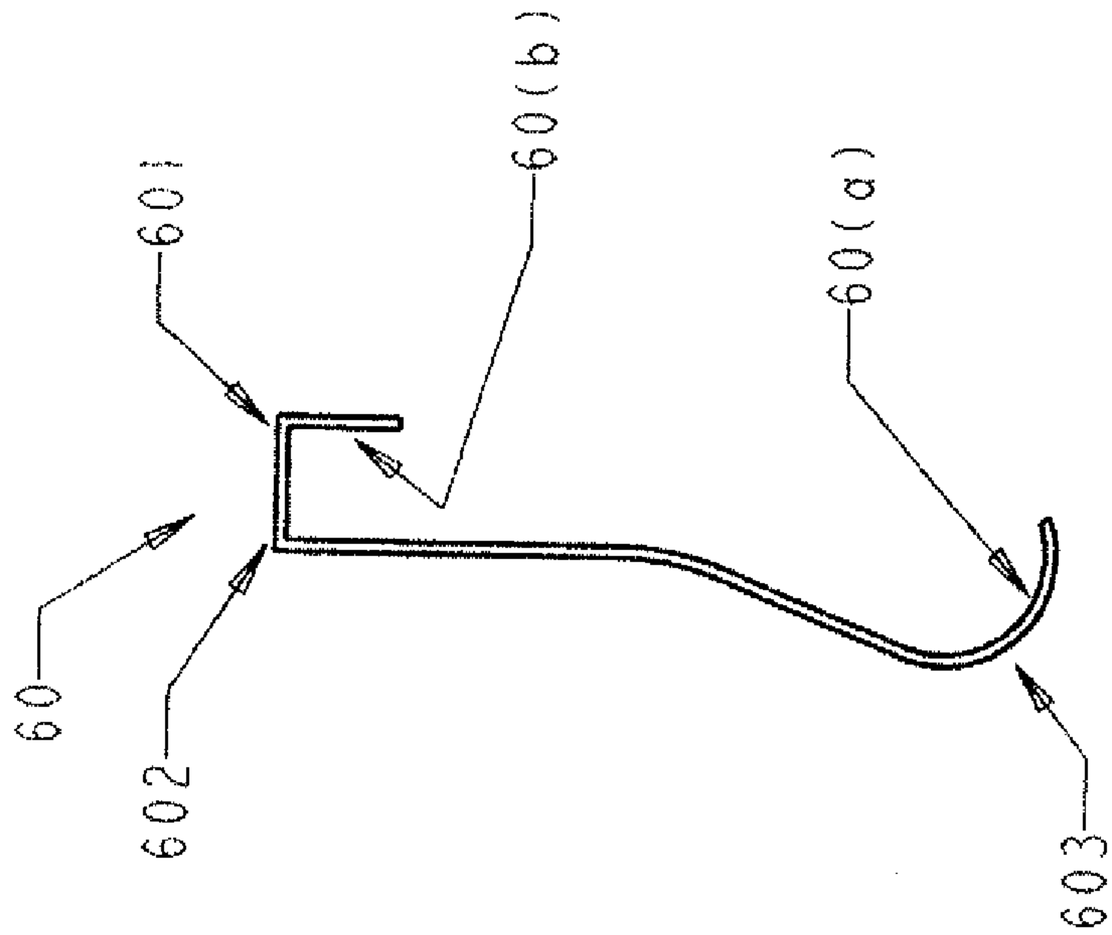

Fig. 29

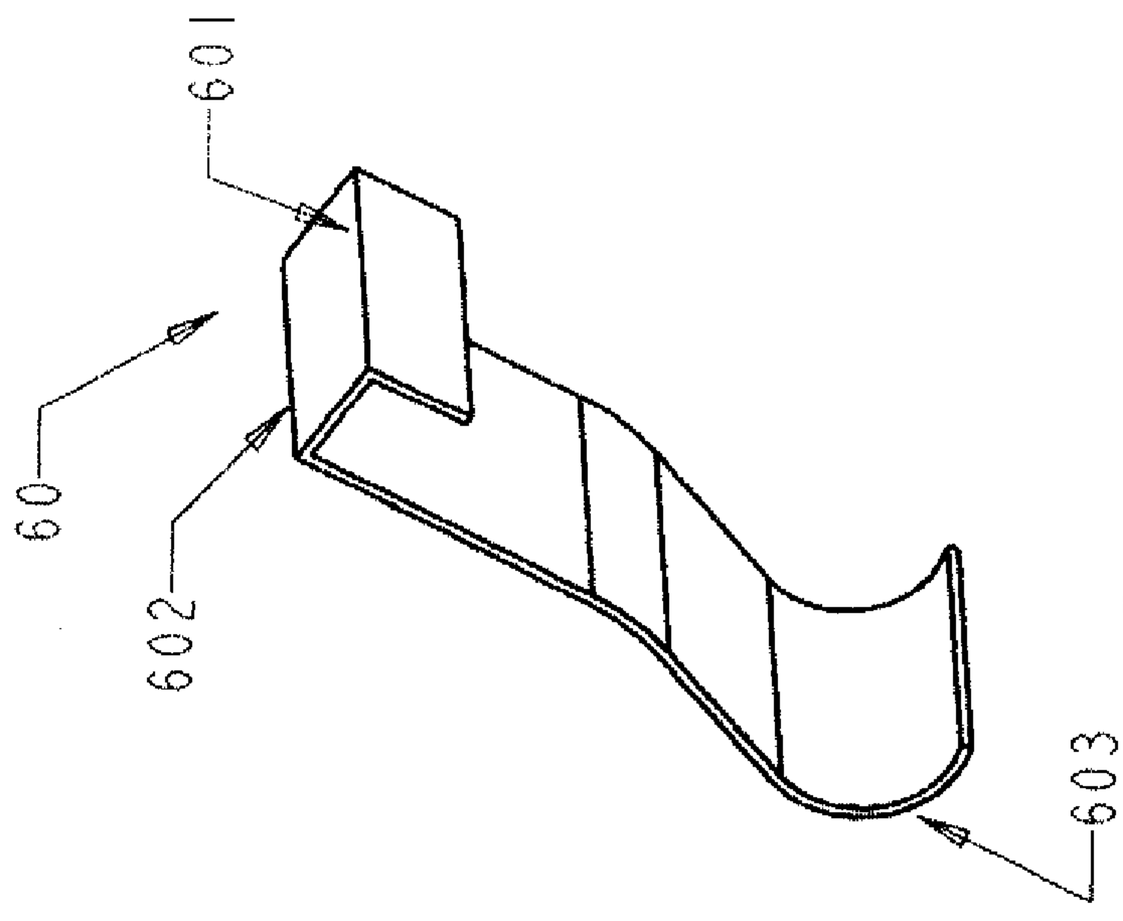

FIG. 29(a)

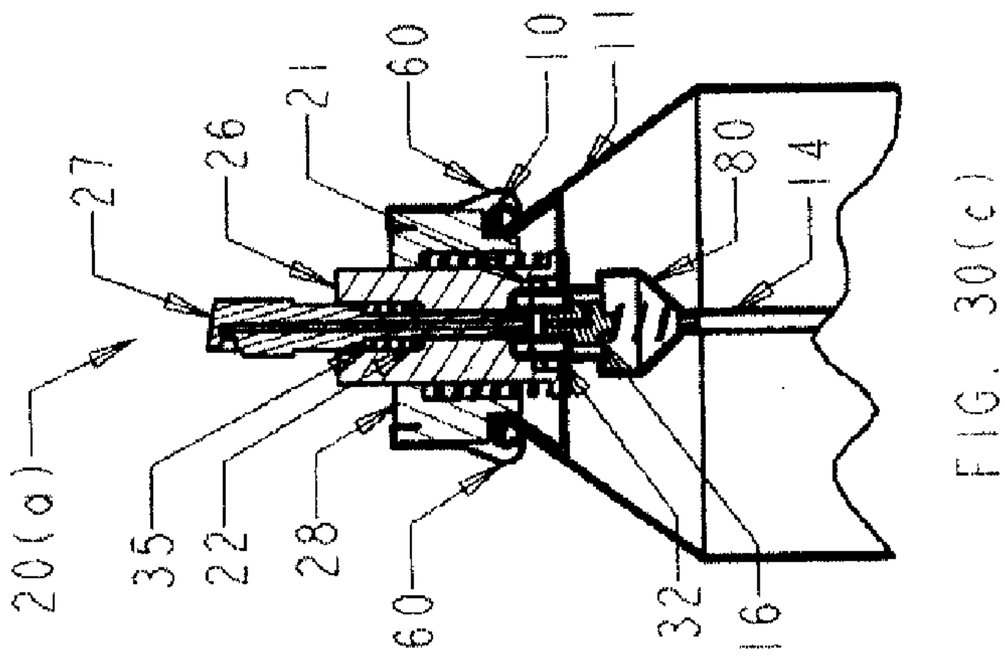

FIG. 30(c)

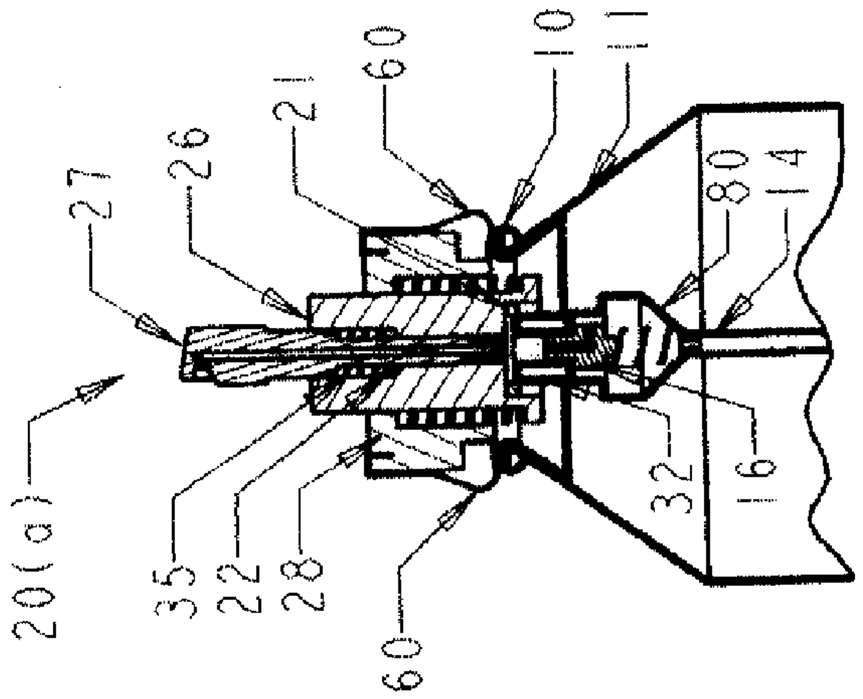

FIG. 30(b)

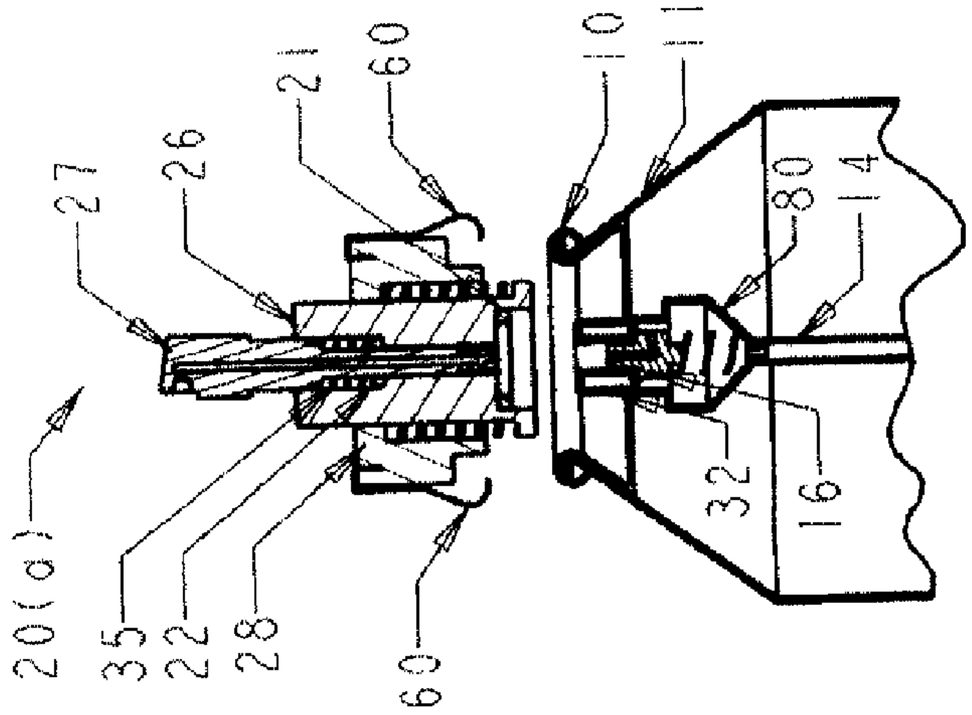

FIG. 30(a)

AEROSOL CONTAINER RESUSCITATOR

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention generally relates to an aerosol container resuscitator assembly for selectively opening a valve or to a so-called aerosol container resuscitator assembly for selective and removable attachment to an aerosol container. More particularly, the present invention relates to an aerosol container resuscitator assembly configured appropriately for selective and removable attachment to a standard/generic aerosol container to restore functionality to a standard/generic aerosol container, which has been damaged or compromised at its outlet, by first opening the valve of the aerosol container's compromised outlet and subsequently directing its product as originally purposed. Note, the aerosol container resuscitator assembly according to the present invention cannot close an aerosol container's valve, and therefore it is not a valve but rather a "wrench" which is limited by design only to open the valve of a compromised outlet of an aerosol container.

2. Description of Prior Art

The prior art is fairly silent on constructions restoring purposed function to compromised aerosol container dispensers and the like. Several of the more pertinent art disclosures, however distant or distinctive, are briefly described hereinafter. For example, U.S. Pat. No. 3,638,840 ('840 patent), which issued to Ishida, discloses a Safety Valve for Aerosol Containers. The '840 patent describes a safety valve for an aerosol container which permits the discharge of the residual propellant gases in a used container when the valve stem is broken off. The container is thereby rendered safe from explosion caused by heat and also cannot be refilled.

U.S. Pat. No. 3,428,224 ('224 patent), which issued to Eberhardt et al., discloses an Aerosol Coatings Applicator. The '224 patent describes a flexible tube extended from a pressurized container to a valve which is carried in the hand of the user. The flexible tube is easily attachable to the pressurized container by way of a removable cap, which cap comprises a rim-receiving fitting for receiving the upwardly extending diametrical rim or mouth of an aerosol container.

U.S. Pat. No. 4,911,336 ('336 patent), which issued to Blake, discloses a Valve with Interchangeable Components. The '336 patent describes a valve in which standardized, interchangeable components are used for converting the valve to use either in a manually operated pump or an aerosol valve. A poppet member is reciprocable in a valve chamber between a flexible valve housing and a main cylinder housing. By making minor modifications to the poppet member and cylinder housing the valve can be adapted or converted to use either in a manually operated pump dispenser or an aerosol dispenser.

Unique valve retaining means for attaching a valve to a container is also disclosed. In one form, snap detents secure together peripheral flanges of the valve housing and cylinder housing and also secure the housings to the container neck. In another form, interfitting structure on the flanges align the housings relative to one another, and a gasket is interposed between the flanges so as to seal the flanges relative to one another and relative to the container neck, with a retaining ferrule engaging and securing the flanges to the container neck.

U.S. Pat. No. 5,183,189 ('189 patent), which issued to Baudin, discloses a control valve comprising a valve stem movable in a valve body, the stem being provided axially with two opposing recessed channels each leading to one end of the stem and separated by a base, two transverse orifices being provided in the lateral wall of the stem on either side of the base, each orifice communicating respectively with a channel, a sealing member held in the valve body and traversed by the stem, a first spring adapted to force the stem, relative to the valve body, in a direction corresponding to an outward movement by the stem, and a second spring disposed so as to prevent outward movement by the stem as long as the pressure in the interior of the container does not exceed a predetermined value.

The two springs are disposed in parallel, one end of the first spring and of the second spring resting against a means stopped by a unilateral stop of the stem, wherein this means can slide relative to the stem in the event of outward movement by the latter, and the second end of the first spring resting against a stop integral with the valve body, while the second end of the second spring rests against a stop integral with the stem. The Baudin disclosure essential purpose is to prevent product discharge from the aerosol container until opened.

U.S. Pat. No. 5,657,908 ('908 patent), which issued to Graver, discloses an Aerosol Fluid Dispenser. The '908 patent describes an apparatus for dispensing an aerosol container's pressurized fluid contents includes a base; a first, outer sleeve mounted on the base; a second, inner sleeve nested within the outer sleeve and defining a bore adapted to receive the container; and a plurality of retainers pivotally mounted to the base within the outer sleeve so as to move from a radially inward position to a radially outward position relative to the centerline of the two sleeves.

The inner sleeve is biased away from the base by a first spring, such that a first internal camming surface on the inner sleeve engages each retainer to urge it radially inwardly into engagement with the container's external curl upon advancement of the container into the nested sleeves, thereby securing the container proximate to the base. Upon moving the inner sleeve towards the base, the sleeve's first internal camming surface disengages the retainers to permit their radial expansion and, hence, the release of the container's external curl.

Further relative movement of the inner sleeve permits a second internal camming surface on the inner sleeve to engage a radial extension of each retainer thereby to further urge each retainer free and clear of the container's external curl. An annular valve-actuating piston, slidably mounted within a tubular guide projecting from the base in alignment with the centerlines of the two sleeves, is biased away from the base and into engagement with the container's integral valve by a second spring interposed between the piston and the base. A length of flexible tubing is attached to the piston to receive the contents of the container released by the piston.

U.S. Pat. No. 6,481,470 ('470 patent), which issued to Rubenic, discloses an Aerosol Can and Contents Salvage Apparatus. The '470 patent describes an apparatus for puncturing an aerosol can valve, draining its contents through the puncture, and for drawing any remaining contents from the can should there be insufficient pressure in the can for it to be fully evacuated when punctured. When the valve is replaced, the can is reusable. The puncturing apparatus has a stationary compartmented piercing tube and a housing that is free to move up and down relative to the piercing tube.

The housing is spring-loaded to offer resistance to movement so that a seal is achieved between the housing and the can before the piercing tube makes contact with the can, and to return the housing to its rest position after each piercing cycle. An air cylinder is used to apply pressure to the bottom of the aerosol can so that it will move downward to engage the piercing tube and release its contents into a first compartment. A drawing cylinder contains a piston and uses vacuum means

to draw contents from the aerosol can and mechanical mean to transfer such content from the apparatus through a discharge port.

United States Patent Application Publication No. 2011/0017780, authored by the Applicant Coroneos, discloses a Valve Assembly, Repair Kit, and Method for Salvaging an Aerosol Container. This publication describes A valve and/or repair kit assembly for restoring functionality to an aerosol container by being selectively and removably attachable the annular container rim adjacent the container outlet, which has been damaged or otherwise compromised. The valve assembly comprises a container-to-assembly interface fitting and a plunger assembly. The fitting interfaces the plunger assembly to the container, which plunger assembly comprises a sleeve, a nut, and a plunger structure. The sleeve comprises communicating cavities in which the nut and plunger structure are received. The plunger structure is coupled to the nut, each of which provide certain conduit. The fitting axially aligns the plunger assembly with the container outlet and matter-conducting conduit thus extends from the container outlet to the assembly outlet via the valve assembly. Certain methodology for discharging container contents is further supported by the valve assembly.

U.S. Pat. No. 8,152,030, which issued to Applicant Coroneos, discloses a Valve Wrench Assembly Kit for Restoring Purposed Function to a Compromised Aerosol Container. The '030 patent describes a valve wrench assembly restores functionality to an aerosol container by being selectively and removably attachable the annular container rim adjacent the container outlet, which has been damaged or otherwise compromised, and by opening the valve of the compromised outlet and subsequently directing the aerosol container's product as purposed. The valve wrench assembly comprises an annular fitting assembly and a plunger assembly. The fitting assembly interfaces the plunger assembly to the container, which plunger assembly comprises a sleeve, a nut, and a plunger structure. The sleeve comprises communicating cavities in which the nut and plunger structure are received. The plunger structure is coupled to the nut, each of which provide certain conduit. The gasket structures axially align the plunger assembly with the container outlet and matter-conducting conduit thus extends from the container outlet to the assembly outlet via the valve wrench assembly.

The latter two disclosures are two initial attempts to address the perceived need in the art for a construction that is selectively and removably attachable to an aerosol container at its container outlet so that users may discharge container contents from the aerosol container despite its having a damaged or otherwise compromised container outlet. The prior art appears to be silent on a construction basically having an interface fitting and certain clamping means for enabling a user to quickly and effectively outfit a compromised aerosol container with the a resuscitator mechanism according to the present invention, as summarized in more detail hereinafter.

SUMMARY OF THE INVENTION

The aerosol container resuscitator assembly according to the present invention is designed to restore the functionality of an aerosol container by restoring its ability to dispense its product as purposed by the OEM (Original Equipment Manufacturer). In this regard, the appropriate configuration of an aerosol container resuscitator assembly is that which facilitates attachment, proper alignment, and leak free activation of the aerosol container resuscitator assembly. The appropriate configuration of the aerosol container resuscitator assembly elements according to the present invention, as embodied in embodiments **20** and **20**(*a*), are generally illustrated in FIGS. **2** and **27** respectively.

The present invention is designed to be usable on aerosol containers where either its valve stem **18** of the integral valve body **16** (See FIG. **9**) is broken off (See FIGS. **12** and **13**); its non-integral valve nozzle **17** (See FIG. **7**) is lost (See FIG. **9**.); or its integral stem-nozzle **17**(*a*) (See FIG. **10**(*b*)) is lost (See FIG. **10**). The present invention is designed to fit all standard/generic aerosol containers known to be currently used for paints, lubricates, etc. without need of modification of either (1) the aerosol container resuscitator assembly, or (2) any known standard/generic aerosol container design as illustrated in FIG. **7**.

Some of the design features of the aerosol container resuscitator assembly are:

It is reusable.

Its attachment is easy, tool free, and fool proof, and prerequisite preparation of an aerosol container is normally unnecessary.

Its driver is a "stand-alone" structure which can be replaced/interchanged without detachment of the aerosol container resuscitator assembly from an aerosol container.

It uses o-ring seals that can be easily changed if damaged or if required for compatibility with a product dispensed from an aerosol container.

It is robust and abuse resistant by design.

It is easily assembled/disassembled without tools for cleaning and other maintenance. It almost fully disassembles itself when detached from an aerosol container.

To achieve the foregoing and other readily apparent objectives, the present invention provides an aerosol container resuscitator assembly for restoring purposed functionality, the aerosol container resuscitator assembly comprising an interface fitting assembly and a driver assembly.

The fitting assembly preferably comprises an annular fitting **28** and contemplated elastically deformable clamping structure **38**. The annular fitting comprises an upper fitting section **40**, a lower fitting section **41**, an upper cavity **42**(*a*), a lower communicating cavity **42**, and contemplated clamping structure receiving geometry as at slot **39** (See FIG. **23**).

The upper fitting section **40** (See FIG. **23**) engages an upper portion **43** (See FIG. **21**) of rim **10** of the aerosol container **11**, and comprises a first exterior diameter **103** greater in magnitude than an inner rim diameter **104** (See FIG. **21**) of rim **10**. The lower fitting section **41** (See FIG. **23**) has a second exterior diameter **107**. The second exterior diameter **107** is lesser than the first exterior diameter **103** and the inner rim diameter **104**.

The surfaces **38**(*b*) and **38**(*c*) of the clamping structure **38** (See FIG. **19**) engage the lower portion **46** of the rim **10** of the aerosol container **11** (See FIG. **21**). The surface **38**(*a*) of the clamping structure **38** (See FIG. **19**) engage clamping structure receiving geometry such as slot **39** (See FIGS. **22** and **23**).

Alternatively, it is contemplated that the fitting assembly may comprise an annular fitting **28**(*a*) and contemplated elastically deformable clamping structure **60**. The annular fitting comprises an upper fitting section **40**, a lower fitting section **41**, an upper cavity **42**(*a*), a lower communicating cavity **42**, and contemplated clamping structure receiving geometry as at slot **70** (See FIGS. **28**).

The upper fitting section **40** (See FIG. **28**) engages an upper portion **43** (See FIG. **21**) of rim **10** of the aerosol container **11**, and comprises a first exterior diameter **103** greater in magnitude than an inner rim diameter **104** (See FIG. **21**) of rim **10**.

The lower fitting section **41** (See FIG. **28**) has a second exterior diameter **107**. The second exterior diameter **107** is lesser than the first exterior diameter **103** and the inner rim diameter **104**.

The inner surface or end **60**(*a*) of the clamping structure **60** (See FIG. **29**) engages the lower portion **46** of the rim **10** of the aerosol container **11** (See FIG. **21**). The inner surface or end **60**(*b*) of the clamping structure **60** (See FIG. **29**) engages clamping structure receiving geometry slot **70** (See FIGS. **28**(*a*) and **28**).

The driver assembly comprises a sleeve **26**, and a driver **27** (See FIG. **14**.). The sleeve **26** comprises a driver-receiving cavity **50** and a spring/seal-receiving cavity **51**, said cavities being in communication with one another (See FIG. **14**.). The driver **27** is received in the spring/seal-receiving cavity **51** and the driver-receiving cavity **50** and comprises conduit **53** and an assembly outlet **30**. (See FIG. **14**.) The driver inlets **54** and **54**(*a*) (See FIG. **14**.) are communicatively engageable with the container outlet **15**. (See FIG. **3**.)

The driver assembly further comprises certain spring (e.g., spring **35** (See FIG. **14**.)) means for biasing the driver **27** to a non-activated position (See FIG. **2**.), which spring means enable the user to selectively discharge container products while concurrently and beneficially compressing the o-ring **22** enhancing its efficacy (See FIG. **3**.). In addition, the driver assembly may further comprise certain spring means (e.g., spring **36** (See FIG. **14**.)) to ensure sleeve-based o-ring **21** contact and compliance with the protrusion **32** of the valve body **80** of the aerosol container (See FIGS. **4** and **5**) for enhancing sealed and directed delivery of aerosol container products from the container outlet **15** to the assembly outlet **30**, and, thereby, also promoting precise alignment of axis **102** of the sleeve **26** with the axis **101** of the aerosol container's protrusion **32** (See FIGS. **24** and **25**.).

The driver **27** is contemplated to comprise a driver shaft **36**(*a*), a protrusion (nozzle) **36**(*d*) which contains the assembly outlet **30**, a protrusion **36**(*c*) which restricts lateral movement of the driver, a protrusion **36**(*b*) which promotes concentric placement of the spring **35** relative to the driver shaft **36**(*a*), and an undercut **36**(*e*) which permits insertion of the driver **27** inlets **54** and **54**(*a*) into the valve inlet **15** of the aerosol container (See FIG. **14**).

BRIEF DESCRIPTION OF THE DRAWINGS

Other features of my invention will become more evident from a consideration of the following brief description of patent drawings:

FIG. **1** is a top perspective view depiction of a preferred embodiment of the aerosol container resuscitator assembly according to the present invention as attached to the upper portion of a fragmentary aerosol container.

FIG. **2** is a sectional view depiction of the preferred embodiment of the aerosol container resuscitator assembly showing the fitting assembly attached to the aerosol container, and showing the driver in a non-activated state.

FIG. **3** is a sectional view depiction of the preferred embodiment of the aerosol container resuscitator assembly showing the fitting assembly attached to the aerosol container showing the driver in an activated state.

FIG. **4** is a first of three sequential sectional view depictions of the preferred embodiment of the aerosol container resuscitator assembly in a relaxed, non-activated state aligned with but positioned above the valve of a compromised aerosol container from which position it can be lowered onto and attached to the aerosol container, and showing a first elastically deformable clamping structure in a non-engaged position exploded from the aerosol container resuscitator assembly.

FIG. **5** is a second of three sequential sectional view depictions of the preferred embodiment of the aerosol container resuscitator assembly according to the present invention lowered onto the aerosol container, the driver being in a relaxed, non-activated state, and the first elastically deformable clamping structure in a non-engaged position exploded from the aerosol container resuscitator assembly.

FIG. **6** is a third of three sequential sectional view depictions of the preferred embodiment of the aerosol container resuscitator assembly according to the present invention lowered onto the aerosol container, the driver being in a relaxed, non-activated state, and the first elastically deformable clamping structure being in an engaged position securing the preferred embodiment to the aerosol container.

FIG. **7** is an enlarged fragmentary sectional depiction of the upper portion of a non-activated standard/generic aerosol container showing an integral valve stem and valve body and attached nozzle.

FIG. **7**(*a*) is a sectional depiction of a non-activated standard/generic aerosol container showing an integral valve stem and valve body and attached nozzle.

FIG. **8** is an enlarged fragmentary sectional depiction of the upper portion of an activated standard/generic aerosol container showing an integral valve stem and valve body and attached nozzle, and showing the ejection path of aerosol container product.

FIG. **8**(*a*) is a sectional depiction of an activated standard/generic aerosol container showing an integral valve stem and valve body and attached nozzle.

FIG. **9** is an enlarged fragmentary sectional depiction of the upper portion of a non-activated standard/generic aerosol container showing an integral valve stem and valve body with a nozzle removed.

FIG. **9**(*a*) is a sectional depiction of a non-activated standard/generic aerosol container showing an integral valve stem and valve body posed with the nozzle removed.

FIG. **10** is an enlarged fragmentary sectional depiction showing the upper portion of a non-activated standard/generic aerosol container showing an integral valve stem and nozzle with the integral valve stem and nozzle removed.

FIG. **10**(*a*) is a sectional depiction showing the upper portion of a non-activated standard/generic aerosol container showing an integral valve stem and nozzle removed from the aerosol container.

FIG. **10**(*b*) is a sectional depiction showing a standard/generic aerosol container integral valve stem and nozzle.

FIG. **11** is an enlarged fragmentary sectional depiction of the upper portion of a non-activated standard/generic aerosol container depicting a trimmed valve stem in which the valve stem and valve body are integral with a nozzle removed therefrom.

FIG. **11**(*a*) is a sectional depiction of a non-activated standard/generic aerosol container depicting a trimmed valve stem in which the valve stem and valve body **16** are integral with nozzle removed therefrom.

FIG. **12** is an enlarged fragmentary sectional depiction of the upper portion of a non-activated standard/generic aerosol container depicting a broken valve stem integral with the valve body and in need of trimming with the nozzle removed therefrom.

FIG. **12**(*a*) is a sectional depiction of a non-activated standard/generic aerosol container depicting a broken valve stem integral with the valve body and in need of trimming with the nozzle removed therefrom.

FIG. **13** is an enlarged fragmentary sectional depiction of the upper portion of a non-activated standard/generic aerosol container depicting a broken valve stem integral with the valve body and not in need of trimming with the nozzle removed therefrom.

FIG. **13**(*a*) is a sectional depiction of a non-activated standard/generic aerosol container depicting a broken valve stem integral with the valve body and not in need of trimming with the nozzle removed therefrom.

FIG. **14** is an exploded sectional view depiction of the preferred embodiment of the aerosol container resuscitator assembly according to the present invention, showing from top to bottom, a driver element, a spring element, a driver-based o-ring element, an annular fitting element, an elastically deformable clamping structure element, a spring element, a sleeve element, and a sleeve-based o-ring element.

FIG. **15** is an enlarged top perspective view depiction of a driver-based o-ring element.

FIG. **16** is an enlarged top perspective view depiction of the sleeve-based o-ring element.

FIG. **17** is an enlarged top perspective view depiction of a first spring element in a relaxed state.

FIG. **18** is an enlarged top perspective view depiction of a second spring element in a relaxed state.

FIG. **19** is an enlarged top perspective view depiction of the elastically deformable clamping structure element.

FIG. **20** is an enlarged top perspective view depiction of the elastically deformable clamping structure element engaging the valve body of an aerosol container.

FIG. **21** is a sectional depiction of the valve body of an aerosol container.

FIG. **22** is an enlarged top perspective view depiction of the annular fitting element.

FIG. **23** is a sectional view depiction of the annular fitting element otherwise depicted in FIG. **22**.

FIG. **24** is a sectional view depiction of an unaligned sleeve and its sleeve-based o-ring prior to sleeve depression in a normal aerosol container resuscitator assembly attachment sequence.

FIG. **25** is a sectional view depiction of an aligned sleeve and its sleeve-based o-ring subsequent to sleeve depression in a normal aerosol container resuscitator assembly attachment sequence.

FIG. **26** is a sectional view depiction of the preferred embodiment of the aerosol container resuscitator assembly attached to an aerosol container having an undamaged valve stem protruding beyond the valve body, and showing the driver element in a non-activated state.

FIG. **27** is a sectional view depiction of an alternative embodiment of the aerosol container resuscitator assembly attached to the aerosol container by means of an alternative clamping structure.

FIG. **27**(*a*) is a perspective view depiction of the alternative embodiment of the aerosol container resuscitator assembly attached to the aerosol container by means of the alternative clamping structure.

FIG. **28** is a sectional view depiction of the alternative embodiment of the aerosol container resuscitator assembly showing the contemplated clamp receiving geometry for receiving the alternative clamping structure.

FIG. **28**(*a*) is a perspective view depiction of the alternative embodiment of the aerosol container resuscitator assembly showing the contemplated clamp receiving geometry for receiving the alternative clamping structure.

FIG. **29** is a side view depiction showing the contemplated geometry of the alternative clamping structure.

FIG. **29**(*a*) is a perspective view depiction showing the contemplated geometry of the alternative clamping structure.

FIG. **30**(*a*) is a first of three sequential sectional view depictions of the alternative embodiment of the aerosol container resuscitator assembly in a relaxed, non-activated state aligned with but positioned above the valve of a compromised aerosol container from which position it can be lowered onto and attached to the aerosol container, the elastically deformable alternative clamping structure being in a non-engaged position.

FIG. **30**(*b*) is a second of three sectional view depictions of the alternative embodiment of the aerosol container resuscitator assembly lowered onto the aerosol container, the driver being is in a relaxed, non-activated state, and the elastically deformable alternative clamping structure being in a non-engaged position.

FIG. **30**(*c*) is a third of three sectional view depictions of the alternative embodiment of the aerosol container resuscitator assembly lowered onto the aerosol container, the driver being in a relaxed, non-activated state, and the elastically deformable alternative clamping structure being in the engaged position securing the alternative embodiment to the aerosol container.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

A typical aerosol container (as at **11**) contains two substances. One substance is an inert gas used as a propellant as generally and generically referenced at **12**. The second substance is a liquid product as generally and generically referenced at **13**. The liquid product **13** may be exemplified by a lubricant, to be delivered by way of the propellant **12**. The inert gas **12** is at high pressure and essentially pushes on the product **13** such that the product **13** travels through the container conduit **14** and exits the container **11** via a container outlet **15**. See generally FIGS. **8** and **9**.

The aerosol container **11** is valved such that the product **13** cannot escape the aerosol container **11** until the valve is opened, usually by pushing down on its nozzle as at **17**. A container conduit **14** extends from the valve at the top of the aerosol container **11** to the bottom of the aerosol container **11**. If the valve is opened and the aerosol container **11** is upright, the product **13** is pushed by the pressurized inert gas **12** through the container conduit **14** and valve body **16** where it then exits the valve **80** assembly and aerosol container **11** through the valve's nozzle **17**. See generally FIG. **8**.

The aerosol container resuscitator assembly **20** according to the present invention is designed to restore the functionality of the aerosol container **11** by restoring its ability to dispense container contents such as the product **13** in the manner purposed by the OEM. In this regard, it is to be noted that the aerosol container resuscitator assembly **20** is designed to be outfitted upon the aerosol container **11** in which the valve stem **18** is integral with the valve body **16** and either the nozzle **17** is lost or the valve stem **18** is broken off (See generally FIGS. **7**, **9**, **12**, and **13**), or in which the valve stem **18** is non-integral with the valve body **16** but rather integral with the nozzle for forming a nozzle element as at **17**(*a*), and the nozzle **17**(*a*) is lost (See, e.g. FIG. **10**).

The preferred aerosol container resuscitator assembly **20** according to the present invention is designed to make any prerequisite preparation of the aerosol container **11** before usage of the aerosol container resuscitator assembly **20** unnecessary or minimal. A lost aerosol container nozzle **17**(*a*) requires no aerosol container **11** prerequisite preparation (See FIG. **10**); however, if any ragged protruding valve stem **18** is

left when an aerosol container is compromised (See FIG. **12**), the prerequisite preparation of the aerosol container **11** is minimal, and simply involves trimming the protruding valve stem **18** with either a knife or scissors to a condition illustrated in FIG. **11**.

It should be further noted that the aerosol container resuscitator assembly **20** is designed to fit all aerosol containers **11** known to be currently used for paints, lubricates, etc. without need of modification of either the aerosol container resuscitator assembly **20** or any known design of an aerosol container **11**. A standard/generic aerosol container **11** of the type usable in combination with the aerosol container resuscitator assembly **20** is illustrated throughout the drawings submitted in support of this specification.

The aerosol container resuscitator assembly **20** is designed to be reusable. In this regard, the aerosol container resuscitator assembly **20** is simply removable from a first aerosol container **11**, whereafter the aerosol container resuscitator assembly **20** may be cleaned as required, and re-installed upon a second aerosol container **11**. Further, the aerosol container resuscitator assembly **20** is designed to be compatible with most products **13** as dispensed from aerosol containers **11**. This is preferably accomplished by use of gasket type o-rings for sealing that can be readily changed and by use of structural materials common to most aerosol containers **11**. In this regard, a protrusion-engaging, sleeve-based o-ring **21** and a driver-engaging, driver-based o-ring **22** are contemplated.

The aerosol container resuscitator assembly **20** may be outfitted with a variety of different types of drivers having different protrusions (nozzles) **36**(*d*), an example of which is generally depicted at driver **27** in FIG. **14**. The interchangeability of drivers, as exemplified by driver **27**, allows the aerosol container resuscitator assembly **20** to accommodate a compromised aerosol container where its undamaged valve stem **16** protrudes beyond the valve body **80** as depicted in FIG. **9** (See FIG. **26**), and allows the user to change the spray pattern of product **13** discharge. In this regard, the spray pattern may be changed into a stream type pattern, a mist type pattern, etc. Further, the interchangeability of drivers, as exemplified by driver **27**, allows the user to easily replace clogged drivers.

In this last regard, it should be further noted that the aerosol container resuscitator assembly **20** is designed to make assembly, cleaning, and other maintenance thereof most simple. Total assembly/disassembly of the aerosol container resuscitator assembly **20** requires no tools. Notably, the aerosol container resuscitator assembly when detached from an aerosol container will for the most part literally disassemble itself.

The aerosol container resuscitator assembly **20** is further designed to simplify the changing of seals if required for compatibility with a product **13** dispensed from an aerosol container **11** or if damaged. The protrusion-engaging, sleeve-based o-ring **21** is exposed, and thus may be installed/removed manually with one's fingers. The driver-based o-ring **22** is installed/removed by pulling out the driver **27**, sliding off the old driver-based o-ring **22** from the driver shaft **36**(*a*), sliding a replacement driver-based o-ring **22** onto the driver shaft **36**(*a*), and reinserting the driver into the driver assembly sleeve **26**. Notably, the aerosol container resuscitator assembly **20** is designed to preclude loss of driver **27** utility from breakage due to abuse. This is accomplished by providing a close fit of appropriate length between the driver protrusion **36**(*c*) and the driver assembly sleeve **26**.

The aerosol container resuscitator assembly **20** is further designed to minimize the learning curve for usage through attachment simplicity and through its activation being as for a standard/generic aerosol container, i.e., push down on the protrusion **36**(*d*) of the driver **27**. Attachment of the aerosol container resuscitator assembly **20** to a container **11** is simply achieved by slipping on the annular fitting **28**. In this regard, the annular fitting **28** is inserted into the container rim **10** after which the elastically deformable clamping structure **38** is received by slot **39** of the annular fitting **28** and the outer radial surface **46** of the container rim **10** (See generally FIGS. **4**, **5**, and **6**).

The elastically deformable clamping structure **38** comprises or is constructed from a single piece of elastically deformable material having a number of bends in the material intermediate its length to effect the overall structure shown in FIGS. **14** and **19**. The (collinear) ends **38**(*a*) of the structure **38** are received in slots **39** formed in the upper surface of the interface fitting **28**. The structure **38** is bent at **381**, **382** in 90 degree angles, and at **383** in 180 degrees so as to form extended portions as at **38**(*b*) and rim-engaging arc length portions as at **38**(*c*). A rounded protrusion is further formed as at **38**(*d*) intermediate the arc length portions **38**(*c*).

When fully assembled upon an aerosol container **11**, the aerosol container resuscitator assembly **20** is operated as would be any standard/generic aerosol container upon which the aerosol container resuscitator assembly **20** may be used. In this regard, the assembly outlet (as at **30**) of the aerosol container resuscitator assembly **20** is pointed or aimed (aiming guidance being provided by appropriate beveling of the top surface of protrusion **36**(*d*) of the driver **27** as illustrated throughout the drawings submitted in support of this specification) in the direction in which the dispensed product **13** is to be ejected. Then the driver **27** is pushed down or depressed with one's finger for communicating the conduit inlets **54** and **54**(*a*) of the driver **27** with the container outlet (as at **15**) such that the aerosol container's product **13** may travel through the conduit structures and exit driver **27** via assembly outlet **30**.

Attachment of the aerosol container resuscitator assembly **20** onto an aerosol container **11** is believed to be fool proof by virtue of its design. The process of outfitting the target aerosol container **11** with an aerosol container resuscitator assembly **20** is accomplished by requiring only two operations which cannot be performed improperly if attachment is to be successful. First, the annular fitting **28** must engage the rim **10** such that the sleeve **26** will be positioned over and around the centrally located protrusion **32** of the shell of the valve **80** assembly.

Since the rim **10** is concentric to the centrally located protrusion **32** of the shell of the valve **80** assembly and since both the rim **10** and the annular fitting **28** are cylindrical of nearly the same diameter, the act of inserting the annular fitting **28** into the rim **10** results in accurate alignment of the axis **102** of the sleeve **26** (See FIG. **24**) with the axis **101** of the protrusion **32** (See FIG. **24**) (See also FIGS. **4**, **5**, and **6**). Second, the clamping structure **38** may be engaged with the rim **10** of the aerosol container **11**. Alternatively, annular fitting **28**(*a*), which is compatible with the clamping structure **60**, is substituted for annular fitting **28** and the clamping structure **60** may be engaged with the rim **10** of the aerosol container **11**.

Precise alignment is achieved when the protrusion-engaging, sleeve-based o-ring **21** is axisymmetrically deformed and becomes compliant with the surface of the protrusion **32** as spring **36** is compressed when the annular fitting **28** engages the rim **10**. This may be understood from a comparative consideration of FIGS. **4** through **6**, **24** and **25**.

The efficacy of the driver-based o-ring **22** seal is enhanced by ramping (as at **34** in FIG. **14**) the driver-based o-ring's seat

34 towards the interfacing surface of the shaft 36(*a*) of the driver 27 and by the spring 35 compressing the driver-based o-ring 22 when the driver 27 is activated thereby increasing the pressures and the footprints at the driver-based o-ring's seat 34 and the interfacing surface of the driver shaft 36(*a*). This may be understood from a consideration of FIG. 3.

The aerosol container resuscitator assembly 20 is further designed such that an exchange/replacement of the driver 27, which facilitates change of the spray pattern of product 13 discharge, requires no tools. In this regard, the driver 27 to be replaced is simply pulled out the driver assembly sleeve 26, and the replacement driver 27 is simply pushed into the driver assembly sleeve 26. This may be understood from a comparative consideration of FIGS. 2 through 6, 14, and 26.

The aerosol container resuscitator assembly 20 is further designed to preclude interference with the driver 27 activation by the spring 35 rubbing against the wall of the spring/seal-receiving cavity 51 of sleeve 26. This is accomplished by protrusion 36(*b*) of driver 27 which engages the spring 35 and promotes concentric alignment of the spring 35 with the spring/seal-receiving cavity 51 of sleeve 26.

The aerosol container resuscitator assembly 20 is further designed to accommodate variations in the height of the protrusion 32 thereby ensuring seal contact and compliance with the protrusion 32. In this regard the spring 36 allows longitudinal translation of the driver assembly sleeve 26 relative to the longitudinal axis of the annular fitting 28.

The aerosol container resuscitator assembly 20 is further designed to accommodate variations in the diameter of the protrusion 32 thereby ensuring seal contact and compliance with the protrusion 32. In this regard the sleeve-based o-ring 21 accommodates variations in the diameter of the protrusion 32.

It will thus be seen that the present invention generally concerns an aerosol container resuscitator assembly for restoring functionality to a standard/generic aerosol container 11 as purposed by the OEM in which the valve stem 18 is integral with the valve body 16 and either the nozzle 17 is lost or the valve stem 18 is broken off, or in which the valve stem 18 is non-integral with the valve body 16 but rather integral with the nozzle for forming nozzle 17(*a*), and the nozzle 17(*a*) is lost. In either case, the aerosol container 11 is rendered inoperable unless re-outfitted with certain means for re-engaging the container outlet 15. The aerosol container resuscitator assembly 20 or 20(*a*) according to the present invention is believed to provide certain means for restoring an aerosol container 11 of this sort to the functionality purposed by the OEM.

As may be seen from an inspection of the various figures, the aerosol container 11 has an annular container rim as at 10 and a container outlet as at 15 (See FIGS. 9 and 10). The aerosol container resuscitator assembly 20 or 20(*a*) according to the present invention cooperate with both the container rim 10 and the container outlet 15 to preferably and selectively discharge container product 13 from the container outlet 15. To achieve this primary objective, the aerosol container resuscitator assembly 20 or 20(*a*) according to the present invention preferably comprise a container-to-assembly annular fitting assembly as exemplified by elements 28 and 38 (or 28(*a*) and 60), and a driver assembly (See FIG. 14).

The fitting assembly comprises an annular fitting 28 and certain clamping means as exemplified by clamping structure 38. The annular fitting 28 comprises an upper fitting section as at 40; a lower fitting section as at 41, and two communicating interior sections as at 39(*a*) and as at 39(*b*) extending through the upper and lower fitting sections 40 and 41 (See FIG. 14). The upper fitting section 40 functions to engage an upper portion 43 of the container rim 10 of an aerosol container 11 (See FIG. 7). The interior section 39(*a*) laterally supports and guides the sleeve 26 whereas the interior section 39(*b*) laterally supports and guides the spring 36.

In this regard, it will be seen that the upper fitting section 40 comprises a first exterior diameter 103 (See FIG. 23) greater in magnitude than an inner rim diameter 104 (See FIG. 21) of the container rim 10, and that the lower fitting section 41 comprises a second exterior diameter as at 107 (See FIG. 23). The second exterior diameter 107 is lesser in magnitude than the first exterior diameter 103 and inner rim diameter 104. The lower fitting section 41 thus functions to position annular fitting 28 against an inner portion 45 (See FIG. 7) of the container rim 10.

Alternatively, the fitting assembly may comprise an annular fitting 28(*a*) and certain clamping means as exemplified by clamping structure 60. The annular fitting 28(*a*) comprises an upper fitting section as at 40; a lower fitting section as at 41, and two communicating interior sections as at 39(*a*) and as at 39(*b*) extending through the upper and lower fitting sections 40 and 41 (See FIG. 28). The upper fitting section 40 functions to engage an upper portion 43 of the container rim 10 of an aerosol container 11 (See FIGS. 7). The interior section 39(*a*) laterally supports and guides the sleeve 26 whereas the interior section 39(*b*) laterally supports and guides the spring 36.

The elastically deformable clamping structure(s) 60 preferably comprises or is constructed from opposed pieces of elastically deformable material having a number of bends in the material intermediate its length to effect the overall structure shown in FIGS. 29 and 29(*a*). The structures 60 comprise a first (planar) end as at 60(*b*), which ends 60(*b*) are received in slots 70 formed in the upper surface of the fitting 28(*a*).

The structures 60 are each bent at 601, 602 in 90 degree angles, and at 603 in an arc length end 60(*a*) for engaging the underside of the container rim as at 46. The structures 60 are laterally opposed when clamping the interface fitting to the container rim 10.

In this regard, it will be seen that the upper fitting section 40 comprises a first exterior diameter 103 (See FIG. 28) greater in magnitude than an inner rim diameter 104 (See FIG. 21) of the container rim 10, and that the lower fitting section 41 comprises a second exterior diameter as at 107 (See FIG. 28). The second exterior diameter 107 is lesser in magnitude than the first exterior diameter 103 and inner rim diameter 104. The lower fitting section 41 thus functions to position annular fitting 28(*a*) against an inner portion 45 (See FIG. 7) of the container rim 10.

The driver assembly essentially comprises a sleeve structure as at sleeve 26 (See FIG. 14); and a driver structure as at driver 27 (See FIG. 14). The sleeve structure, sleeve 26, comprises a spring/seal-receiving cavity as at 51 and a driver-receiving cavity as at 50 (See FIG. 14). The cavities 50 and 51 are in communication with one another as generally depicted.

The driver structure, driver 27, is received in the cavities 50 and 51 and comprises certain driver-based conduit as at 53 and conduit inlets as at 54 and 54(*a*) and a conduit outlet as at 30 (See FIG. 14). In addition the driver structure, driver 27, comprises driver-based protrusion 36(*d*) which forms a nozzle type structure containing the outlet 30 of the aerosol container resuscitator assembly 20.

The sleeve 26 is coupled to the through-hole 42(*a*) (See FIG. 23) for enabling matter such as container products 13 to pass from the container outlet 15 to the outlet 30 via the inlets 54 and 54(*a*) and the driver-based conduit 53 (See FIG. 14). The aerosol container resuscitator assembly 20(*a*) according to the present invention thus functions to restore functionality

to the aerosol container **11** in which the nozzle **17**/**17**(*a*) is missing or in which the valve stem **18** integral with the valve body **16** is broken (See FIGS. **9**, **10**, **12**, and **13**).

The aerosol container resuscitator assemblies according to the present invention may preferably comprise certain spring means as exemplified by the spring element **35** (See FIGS. **14** and **17**) and the spring element **36** (See FIGS. **14** and **18**) where the spring **35** is for biasing the driver **27** to a non-activated position. The exemplified spring means as at spring **35** thus enable the user to selectively discharge container products.

Spring element **36**, by contrast, is for ensuring sleeve-based o-ring **21** contact and compliance with the protrusion **32** and the surface **33** (See FIG. **14**) of the sleeve **26** thereby ensuring sealed and directed delivery of aerosol container products from the container outlet **15** to the assembly outlet **30** and thereby also promoting precise alignment between the axis **102** of the sleeve **26** and the axis **101** of the aerosol container's protrusion **32** (See FIGS. **24** and **25**).

While the above description contains much specificity, this specificity should not be construed as limitations on the scope of the invention, but rather as an exemplification of the invention. For example, it is contemplated that the present invention essentially provides an aerosol container resuscitator assembly **20** or **20**(*a*) to restore the function of an aerosol container **10** as purposed by the OEM and, thereby, to discharge an aerosol container product as purposed by the OEM. The aerosol container resuscitator assembly according to the present invention is believed to essentially comprise certain attachment means (as may be exemplified by the annular fitting assembly) for attaching certain replacement discharge means (as may be exemplified by the driver assembly) to an aerosol container.

It is contemplated that said attachment means may be outfitted upon an aerosol container having a compromised, damaged, or broken container outlet, and that the replacement discharge means may be attached to the aerosol container adjacent the container outlet via the attachment means so as to discharge container products from the aerosol container via the compromised container outlet. The container products may thus be discharged both through the container outlet and said attachment means. The discharge means may further comprise axially displaceable structure, which axially displaceable structure may well function to depress the container outlet thereby discharging container products.

The present invention preferably thus provides an aerosol container resuscitator assembly to restore a compromised aerosol container outlet, which aerosol container has an annular container rim and a container outlet. The aerosol container resuscitator assembly comprises certain fastening means as exemplified by a container-to-assembly interface fitting as at **28** or as at **28**(*a*) and certain clamping means as exemplified by clamping structure(s) as at **38** or as at **60** as well as a driver assembly as previously described.

The aerosol container resuscitator assembly according to the present invention essentially functions to direct aerosol container product discharge, and essentially comprises an interface fitting assembly and a driver assembly. The fitting assembly comprises an annular fitting and a three-dimensional, elastically deformable, clamping structure. The annular fitting comprises an upper fitting section, a lower fitting section, and a driver assembly-receiving cavity extending through the upper and lower fitting sections.

The upper fitting section has a first exterior diameter as at **103**, an upper fitting surface as at **391**, a lower fitting surface as at **392**, and a fitting thickness as at **40** between the upper and lower fitting surfaces **391** and **392**. The first exterior diameter **103** is neater in magnitude than an inner rim diameter **104** of said aerosol container rim **10**. The upper fitting surface **391** preferably comprises diametrically-aligned, radially-opposed clamp-receiving grooves as at **39** opposite the driver assembly-receiving cavity.

The lower fitting surface **392** engages an upper portion **43** of an aerosol container rim **10**, and the lower fitting section has a second exterior diameter as at **107** lesser than the first exterior diameter **103** and inner rim diameter **104**. The lower fitting section positions the annular fitting against an inner portion of said aerosol container rim **10**. The three-dimensional, elastically deformable clamping structure as at **38** integrally comprises a generally U-shaped or arcuate structure in a first dimension (i.e. opposed structural portions **38**(*b*), **38**(*c*), as connected by portion **38**(*d*)); and laterally opposed r-shaped, upper section-engaging structures or structural portions in a second dimension, (i.e. those structural portions **38**(*a*) and **393**).

The U-shaped structure is elastically deformable and when in its relaxed state, is shaped so as to engage a select arc length of an outer diameter of the aerosol container rim **10** lesser than its maximum outer diameter as at **110**. The r-shaped structures each have a fitting spanning section (as at **393**) and a fitting clamping section as at **38**(*a*). The fitting spanning sections **393** span the fitting thickness **40**, and the fitting clamping sections **38**(*a*) are receivable in the clamp-receiving grooves **39** for clamping the interface fitting assembly to the aerosol container rim **10**.

The driver assembly comprises a sleeve and a driver. The sleeve extends through the driver assembly-receiving cavity and comprises axially opposed spring/seal-receiving and driver-receiving cavities. The spring/seal-receiving and driver-receiving cavities are in communication with one another, and the driver is received in the spring/seal-receiving and driver-receiving cavities. The driver comprises an assembly outlet and driver conduit having a conduit inlet. The conduit inlet is communicatively engageable with a container outlet on the aerosol container for enabling matter to pass from the container outlet to the assembly outlet via the conduit inlet and driver conduit.

The driver assembly essentially comprises a sleeve and a driver. The sleeve comprises a spring/seal-receiving cavity and a driver-receiving cavity which cavities are in communication with one another. The driver is received in the spring/seal-receiving cavity and the driver-receiving cavity and comprises driver-based conduit and a driver outlet. The conduit inlet is communicatively engageable with the container outlet thereby providing matter-conducting conduit from the conduit inlet to the conduit outlet. The sleeve is coupled to the through-hole for enabling matter to pass from the container outlet to the conduit outlet via driver-based conduit.

Further, the foregoing specifications are believed to support certain methodology for discharging container products **13** from an aerosol container **11**. In this regard, the present invention is believed to support an aerosol container products discharging method comprising the steps of: attaching an assembly such as the aerosol container resuscitator assembly **20** or **20**(*a*) to an aerosol container or container such as container **11** via the container rim **10** thereof, which valve **80** assembly comprises axially displaceable conduit as depicted in FIG. **2** (in which the driver is shown in a non-activated state with the conduit being shown in a first axial position) versus FIG. **3** (in which the driver is shown in an activated state with the conduit being shown in a second axial position relative to the first axial position).

The axially displaceable conduit is thereby communicatively engageable with a container outlet **15** of the aerosol

container **11**. Thus, when the conduit is axially displaced towards the container outlet **15** the action is designed to release container products **13** from the aerosol container **11** via the valve body **16** and container outlet **15**, whereafter container products are directed through said conduit to an assembly outlet as at **30** of the aerosol container resuscitator assembly **20** or **20**(*a*) thereby discharging container products **13** from the aerosol container **11**.

As earlier set forth, at least one portion or a select portion of the aerosol container resuscitator assembly **20** or **20**(*a*) is interchangeable, the interchangeability of which enables the user to, among other acts, selectively manage the conduit or assembly outlet at **30**. In this regard, it is contemplated that drivers such as driver **27** may be interchanged for generalized maintenance, to accommodate an undamaged valve stem **16** which protrudes beyond the valve body **80**, and/or to alter the spray pattern as desired by the user.

As further mentioned hereinabove, the aerosol container resuscitator assembly may preferably comprise certain spring means for biasing aerosol container resuscitator assembly to a non-activated position (as generally depicted in FIG. **2**). In this regard, it is contemplated that the method may comprise the additional step of biasing the aerosol container resuscitator assembly conduit (as at **53**) away from the container outlet **15** after directing container products **13** through said conduit **53**. The spring means thus enable the user to selectively discharge container products **13** after attaching the aerosol container resuscitator assembly to the container rim **10**.

As further mentioned hereinabove, the aerosol container resuscitator assembly may preferably comprise certain spring means to enable the aerosol container resuscitator assembly to accommodate variations in height of the protrusion **32** thereby ensuring seal contact and compliance with the protrusion **32**.

As further mentioned hereinabove, the aerosol container resuscitator assembly may preferably comprise certain gasket means to enable the aerosol container resuscitator assembly to accommodate variations in the diameter of the protrusion **32** thereby ensuring seal contact and compliance with the protrusion **32**.

Accordingly, although the invention has been described by reference to certain alternative embodiments, and certain methodology, it is not intended that the novel disclosures herein presented be limited thereby, but that modifications thereof are intended to be included as falling within the broad scope and spirit of the foregoing disclosure, the following claims and the appended drawings.

I claim:

1. An aerosol container resuscitator assembly for directing aerosol container product discharge, the aerosol container resuscitator assembly thereof comprising:

an interface fitting assembly, said fitting assembly comprising an annular fitting and a three-dimensional, elastically deformable, clamping structure, the annular fitting comprising an upper fitting section, a lower fitting section, and a driver assembly-receiving cavity extending through the upper and lower fitting sections, the upper fitting section having a first exterior diameter, an upper fitting surface, a lower fitting surface, and a fitting thickness between the upper and lower fitting surfaces, the first exterior diameter being greater in magnitude than an inner rim diameter of said aerosol container rim, the upper fitting surface comprising diametrically-aligned, radially opposed clamp-receiving grooves opposite the driver assembly-receiving cavity, the lower fitting surface for engaging an upper portion of an aerosol container rim, the lower fitting section having a second exterior diameter being lesser than the first exterior diameter and inner rim diameter, the lower fitting section for positioning the annular fitting against an inner portion of said aerosol container rim, the three-dimensional, elastically deformable clamping structure integrally comprising a U-shaped structure in a first dimension and opposed r-shaped structures in a second dimension, the U-shaped stricture being elastically deformable and when in its relaxed state, is shaped so as to engage a select arc length of an outer diameter of the aerosol container rim lesser than its maximum outer diameter, the r-shaped structures each having a fitting spanning section and a fitting clamping section, the fitting spanning section for spanning the fitting thickness, the fitting clamping section being receivable in the clamp-receiving grooves for clamping the interface fitting assembly to the aerosol container rim; and

a driver assembly, the driver assembly comprising a sleeve and a driver, the sleeve extending through the driver assembly-receiving cavity and comprising axially opposed spring/seal-receiving and driver-receiving cavities, said spring/seal-receiving and driver-receiving cavities being in communication with one another, the driver being received in the spring/seal-receiving and driver-receiving cavities and comprising an assembly outlet and driver conduit a conduit inlet of which driver conduit is communicatively engageable with a container outlet on the aerosol container for enabling matter to pass from the container outlet to the assembly outlet via the conduit inlet and driver conduit, the aerosol container resuscitator assembly thusly for directing aerosol container product discharge.

2. The aerosol container resuscitator assembly of claim **1** wherein the driver assembly comprises spring means for biasing the driver to a non-activated position, said spring means thus enabling the user to selectively discharge container products.

3. The aerosol container resuscitator assembly of claim **2** wherein the driver assembly comprises spring means for preloading o-ring gasket seals, said spring means thus enhancing sealed and directed delivery of container products from the container outlet to the conduit outlet.

4. The aerosol container resuscitator assembly of claim **3** wherein the driver assembly comprises spring means to accommodate variations in height between aerosol containers of an upwardly extending protrusion of the aerosol container thereby ensuring seal contact and compliance with the protrusion.

5. The aerosol container resuscitator assembly of claim **4** wherein the driver assembly comprises O-ring gasket means for accommodating variations in diameter between aerosol containers of an upwardly extending protrusion of the aerosol container thereby ensuring sealed and directed delivery of container products from the container outlet to the conduit outlet.

6. The aerosol container resuscitator assembly of claim **5** wherein the driver assembly comprises o-ring gasket means for axially aligning the driver assembly with an upwardly extending protrusion of the aerosol container thereby enhancing sealed and directed delivery of container products from the container outlet to the conduit outlet.

7. The aerosol container resuscitator assembly of claim **6** wherein the driver-receiving cavity comprises ramped o-ring gasket seat structure, the o-ring ramped gasket seat structure for enhancing sealed and directed delivery of container products from the container outlet to the assembly outlet.

8. The aerosol container resuscitator assembly of claim 7 wherein the driver comprises a shaft having one concentric, revolved protrusion emulating a nozzle and wherein the driver is a stand-alone structure, the driver enabling the user, without disassembly of the aerosol container resuscitator assembly, to selectively interchange drivers for selectively shaping aerosol container product discharge or to accommodate an undamaged valve stem which protrudes beyond the valve body of the aerosol container.

9. An aerosol container resuscitator assembly for directing aerosol container product discharge, the aerosol container resuscitator assembly thereof comprising:

an interface fitting assembly, said fitting assembly comprising an annular fitting and an elastically deformable, clamping structure, the annular fitting comprising an upper fitting section, a lower fitting section, and a driver assembly-receiving cavity extending through the upper and lower fitting sections, the upper fitting section having a first exterior diameter, an upper fitting surface, a lower fitting surface, and a fitting thickness between the upper and lower fitting surfaces, the first exterior diameter being greater in magnitude than an inner rim diameter of said aerosol container rim, the upper fitting surface comprising clamp-receiving geometry opposite the driver assembly-receiving cavity, the lower fitting surface for engaging an upper portion of an aerosol container rim, the lower fitting section having a second exterior diameter being lesser than the first exterior diameter and inner run diameter, the lower fitting section for positioning the annular fitting against an inner portion of said aerosol container rim, the elastically deformable clamping structure comprising a U-shaped structural portion and two opposed r-shaped structural portions, the U-shaped structure being elastically deformable and when in its relaxed state, is shaped so as to engage a select arc length of an outer diameter of the aerosol container rim lesser than its maximum outer diameter, the r-shaped structures each having a fitting clamping section, the fitting clamping section being receivable in the clamp-receiving geometry for clamping the interface fitting assembly to the aerosol container rim; and

a driver assembly, the driver assembly comprising a sleeve and a driver, the sleeve extending through the driver assembly-receiving cavity and comprising axially opposed spring/seal-receiving and driver-receiving cavities, said spring seal-receiving and driver-receiving cavities being in communication with one another, the driver being received in the spring/seal-receiving and driver-receiving cavities and comprising an assembly outlet and driver conduit a conduit inlet of which driver conduit is communicatively engageable with a container outlet on the aerosol container for enabling matter to pass from the container outlet to the assembly outlet via the conduit inlet and driver conduit, the aerosol container resuscitator assembly thusly for directing aerosol container product discharge.

10. The aerosol container resuscitator assembly of claim 9 wherein the driver assembly comprises spring means for biasing the driver to a non-activated position, said spring means thus enabling the user to selectively discharge container products.

11. The aerosol container resuscitator assembly of claim 10 wherein the driver assembly comprises spring means for preloading o-ring gasket seals, said spring means thus enhancing sealed and directed delivery of container products from the container outlet to the conduit outlet.

12. The aerosol container resuscitator assembly of claim 11 wherein the driver assembly comprises spring means to accommodate variations in height between aerosol containers of an upwardly extending protrusion of the aerosol container thereby ensuring seal contact and compliance with the protrusion.

13. The aerosol container resuscitator assembly of claim 12 wherein the driver assembly comprises o-ring gasket means for accommodating variations in diameter between aerosol containers of an upwardly extending protrusion of the aerosol container thereby ensuring sealed and directed delivery of container products from the container outlet to the conduit outlet.

14. The aerosol container resuscitator assembly of claim 13 wherein the driver assembly comprises o-ring gasket means for axially aligning the driver assembly with an upwardly extending protrusion of the aerosol container thereby enhancing sealed and directed delivery of container products from the container outlet to the conduit outlet.

15. The aerosol container resuscitator assembly of claim 14 wherein the driver-receiving cavity comprises ramped o-ring gasket seat structure, the o-ring ramped gasket seat structure for enhancing sealed and directed delivery of container products from the container outlet to the assembly outlet.

16. The aerosol container resuscitator assembly of claim 15 wherein the driver comprises a shaft having one concentric, revolved protrusion emulating a nozzle and wherein the driver is a stand-alone structure, the driver enabling the user, without disassembly of the aerosol container resuscitator assembly, to selectively interchange drivers for selectively shaping aerosol container product discharge or to accommodate an undamaged valve stem which protrudes beyond the valve body of the aerosol container.

17. A aerosol container resuscitator assembly for directing aerosol can product discharge, the aerosol container resuscitator assembly comprising:

an interface fitting assembly, said fitting assembly comprising a fitting and elastically deformable clamping structure, the fitting having a fitting axis and comprising an upper fitting section, a lower fitting section, and an inner section, the upper fitting section being seatable upon an upper portion of an aerosol container rim having a rim axis, the lower fitting section cooperably positioning the rim axis of the rim concentrically with the fitting axis of the fitting, the elastically deformable clamping structure comprising an arcuate structural portion and laterally opposed, upper section-engaging structural portions, the arcuate structural portion being elastically deformable past a select rim diameter and the upper section-engaging structural portions for engaging the upper section for securing the fitting to said rim wherein the elastically deformable clamping structure integrally comprises a U-shaped structure in a first dimension and opposed r-shaped structures in a second dimension, wherein the r-shaped structures each having a fitting spanning section and a fitting clamping section, the fitting spanning section for spanning the fitting thickness, the fitting clamping section being receivable in clamp-receiving grooves for clamping the interface fitting assembly to the aerosol container rim; and

a driver assembly, the driver assembly comprising a sleeve and a driver, the sleeve comprising axially opposed spring/seal-receiving and driver-receiving cavities, said cavities being in communication with one another, the driver being received in the spring/seal-receiving and driver-receiving cavities and comprising an assembly outlet and driver conduit a conduit inlet of which driver

conduit is communicatively engageable with a container outlet on the aerosol container for enabling matter to pass from the container outlet to the assembly outlet via the conduit inlet and driver conduit, the aerosol container resuscitator assembly thusly for directing aerosol container product discharge.

18. The aerosol container resuscitator assembly of claim **17** wherein the driver assembly comprises spring means for biasing the driver to a non-activated position, said spring means thus enabling the user to selectively discharge container products.

19. The aerosol container resuscitator assembly of claim **17** wherein the driver assembly comprises spring means for preloading o-ring gasket seals, said spring means thus enhancing sealed and directed delivery of container products from the container outlet to the conduit outlet.

20. The aerosol container resuscitator assembly of claim **17** wherein the driver assembly comprises spring means to accommodate variations in height between aerosol containers of an upwardly extending protrusion of the aerosol container thereby ensuring seal contact and compliance with the protrusion.

21. The aerosol container resuscitator assembly of claim **17** wherein the driver assembly comprises o-ring gasket means for accommodating variations in diameter between aerosol containers of an upwardly extending protrusion of the aerosol container thereby ensuring sealed and directed delivery of container products from the container outlet to the conduit outlet.

22. The aerosol container resuscitator assembly of claim **17** wherein the driver assembly comprises o-ring gasket means for axially aligning the driver assembly with an upwardly extending protrusion of the aerosol container thereby enhancing sealed and directed delivery of container products from the container outlet to the conduit outlet.

23. The aerosol container resuscitator assembly of claim **17** wherein the driver-receiving cavity comprises ramped o-ring gasket seat structure, the o-ring ramped gasket seat structure for enhancing sealed and directed delivery of container products from the container outlet to the assembly outlet.

24. The aerosol container resuscitator assembly of claim **17** wherein the driver comprises a shaft having one concentric, revolved protrusion emulating a nozzle and wherein the driver is a stand-alone structure, the driver enabling the user, without disassembly of the aerosol container resuscitator assembly, to selectively interchange drivers for selectively shaping aerosol container product discharge or to accommodate an undamaged valve stem which protrudes beyond the valve body of the aerosol container.

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